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ABSTRACT

This study found no significant difference in classroom teaching performance between participants enrolled in the three semester on-site teacher preparation sequence and participants enrolled in a one semester on-campus and two semester on-site sequence. Subjects were 39 volunteer undergraduate students enrolled in the Department of Secondary Education at Arizona State University, randomly assigned to two experimental groups. Group A spent three semesters in on-site experiences which included observation/participation activities and weekly on-site seminars. Participation activities were increased throughout the program. Group B spent the first semester in on-campus activities which included seminars, microteaching, using audiovisual materials, group dynamics, set induction theory, lesson plans, and interaction analysis. Group B's second and third semester experiences paralleled those of Group A. During the last semester, two 45-minute live classroom observations were made on each participant using the Instrument for the Observation of Teaching Activities (IOTA). Data were analyzed by computing t ratios for each of the 14 observation scales based on the mean scores of the two observations. Since there was no difference in performance between the groups, it was recommended that Sequence B be adopted for logistical reasons, and that a longitudinal follow-up study be conducted on participants. (Author/RT)

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AN ASSESSMENT OF THE EFFECTS OF TWO EXPERIMENTAL ARRANGEMENTS ON THE CLASSROOM BEHAVIOR OF STUDENT TEACHERS AS MEASURED BY IOTA

by

Donald E. Edward Kelly

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AN ASSESSMENT OF THE EFFECTS OF TWO EXPERIMENTAL ARRANGEMENTS

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AS MEASURED BY IOTA

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ABSTRACT

The purpose of this study was to determine if participants enrolled in a three semester on-site teacher preparation sequence would demonstrate significant differences in classroom teaching activities from those participants enrolled in a one semester on-campus and two semester on-site teacher preparation sequence.

This experiment was limited to students enrolled in the undergraduate curriculum in the Department of Secondary Education at Arizona State University who volunteered to take part in the experimental pilot program and were randomly assigned to experimental Groups A and B, composed of 19 and 20 students respectively.

Group A spent three semesters in on-site experiences which included observation/participation activities and weekly on-site seminars. Participation activities were increased throughout the program with the third and final semester of the project being the practice teaching or internship experience.

Group B spent the first semester of the program in on-campus activities which included seminars, microteaching, effective utilization of audiovisual materials, group dynamics, set induction theory, the preparation of a unit of instruction, and training in the use

of interaction analysis. Group B's second and third semester experiences paralleled those of Group A.

This assessment of the experimental Pilot Project was concerned with obtaining empirical evidence about the classroom teaching activities of the participants to assist the Department of Secondary Education at Arizona State University in designing and implementing a teacher preparation program with maximum utilization of sequence, materials, and activities. Data provided in this study and companion investigations will provide a source of baseline data to facilitate the decision making process concerning the sequence and nature of the secondary teacher training program.

During the final semester of the experimental study all students in both groups were posttested with the 14 observation scales of IOTA. Two 45 minute live classroom observations were made on each participant. Analysis of the data were accomplished by computing t ratios for each of the 14 observation scales based on the mean scores of the two observations.

An analysis of the data revealed no significant differences in the mean behavior of experimental Group A and experimental Group B as measured by the 14 observation scales of IOTA.

Based upon the results of this study it was recommended that it would make no difference, with regard to the classroom teaching activities of secondary trainees, which of the experimental

sequences were incorporated into the regular undergraduate curriculum in the Secondary Education Department at Arizona State University. It was further recommended that it might be desirable to incorporate the shorter of the two on-site sequences due to physical and logistic problems; that further study be undertaken to compare the classroom teaching activities of new sequences added to the experimental project; that other instruments be used to assess possible differences in attitudinal and non-verbal behavior patterns of trainees; and that a longitudinal follow-up study be conducted on the participants of Group A and Group B during the initial phases of their professional careers.

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CHAPTER I

INTRODUCTION

Criticisms have been expressed during the past decade concerning the quality of pre-school, elementary, secondary, and higher education in the United States. Teacher education programs have been the target of much of this criticism during this period of time.

Dickson has stated that there is widespread agreement that teachers and their education are the principal substance behind any effort made for the ultimate improvement of the total educational milieu. The time has arrived to center attention on change and reform in teacher education.[1]

Klopf recommended that reform in teacher education be centered around additional varieties of on-site laboratory experiences for teacher trainees at the pre-service level.

> The teacher education process itself needs to have a stronger component for developing teacher competencies through a much greater range of practica, field experiences, student teaching, and internships, each involving a high quality of supervision and a very close working relationship between the pre-service training staff of the institution of higher education and the administrative, supervisory, and instructional staff of the public schools.

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[1]George Dickson, "International Teacher Education Research: A New Frame of Reference for Teacher Education Reform," The Journal of Teacher Education, 17:277, Fall, 1967.

[2]Gordon Klopf, "Conviction and Vision in Teacher Education," The Journal of Teacher Education, 17:4, Spring, 1966.

Combs conceded that there have been many careful and thoughtful studies conducted on teacher preparation by qualified and dedicated researchers. However, in spite of all of the critical speeches, pamphlets, books, and articles, Combs concluded that:

> The product of all of this kind of effort and discussion has been bitterly disappointing. For the most part it has resulted in little more than a reshuffling of the same old courses, a heavier load of content for teacher education students, and some changes in procedures for the certification and licensing of teachers. This is not enough.
>
> Teacher education needs more than a tinkering job. What is called for is a re-examination of the problem in light of our changing social needs on one hand, and our understandings about human behavior and learning on the other.[3]

Rivlin was supportive of the position taken by Combs and Dickson when he said that:

> Student teaching is the most valuable part of preparation for teaching. Nevertheless, student teaching, as it is generally conducted, is far from adequate for the preparation and training of today's teachers; and it needs far more than patchwork changes to make it adequate. There is just too big a gap between the limited experience and responsibility of the student teacher and the full responsibility of a classroom teacher which they are expected to assume immediately upon graduation from a teacher training program.[4]

Teacher education is the cooperative responsibility of the colleges which prepare teachers, the state departments of education, various professional organizations, and local school districts.

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[3] E. Brooks Smith (ed.), Partnerships in Teacher Education (Washington, D. C.: American Association of Colleges for Teacher Education, 1969), p. 10.

[4] Harry N. Rivlin, "A New Pattern for Urban Teacher Education," The Journal of Teacher Education, 17:177, Summer, 1966.

A review of pre-service teacher education programs indicates that educators need to re-focus their attention to the totality of teacher education, plan more wisely in terms of the most appropriate expe-riences to be provided at the pre-service level, and coordinate efforts to promote continuous development of teachers from recruit-ment to the end of their teaching careers.[5]

In the past several years there has been movement toward more collaboration in teacher education, particularly the laboratory phase. The problems encountered by personnel from schools, colleges, state departments of education, professional organizations and the federal government have been contributed to the need for cooperative arrangements involving schools, colleges and related agencies in the education of teachers. As a result, some institutions and agencies have already established cooperative ventures. Others need infor-mation which will assist in developing working partnerships. Still others, while not denying the problem, are not sure that collaboration is the answer.

New structures and mechanisms for teacher education are being formed and tested. These new structures call for new roles and fundamental arrangements of responsibilities. Public schools are finding their way toward including teacher education as a high priority function. Customary arrangements for student teaching

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[5]E. Brooks Smith (ed.), "Promises and Pitfalls in the Trent Toward Collaboration," Partnership in Teacher Education (Washington, D. C.: American Association of Colleges for Teacher Education, 1969), p. 13.

are being remodeled, and student teaching in its previous form is becoming increasingly ineffective. Teacher education needs full cooperation of schools and colleges and a fundamental review of purposes, functions, roles and responsibilities.[6]

The primary objectives of the Pilot Project in Secondary Education at Arizona State University were to organize and structure the experiences of a revised secondary education pre-service curriculum to make use of the value of the extended laboratory experiences for teachers in preparation and to investigate means of integrating the efforts of the College of Education, various academic disciplines, and the public schools toward the production of effective and competent teachers.[7] This study was concerned with the effects of the two contrasting experimental arrangements of the Pilot Project in which two groups of students spent different lengths of time in the schools. The investigator assessed the differences in classroom teaching activities of participants as a result of the two different training sequences.

The 14 observation scales of the Instrument for the Observation of Teaching Activities, hereafter referred to as IOTA, were used as the criterion measure in assessing the classroom teaching activities

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[6]Phillip W. Perdew, "Reflections on a Conference," Partnership in Teacher Education, ed. E. Brooks Smith (Washington D. C.: American Association of Colleges for Teacher Education, 1969), p. 11.

[7]James Bell, John Bell, and LeRoy Griffith, "Pilot Project in Secondary Teacher Education" (Mimeographed, Arizona State University, 1969).

of the two experimental groups involved in the Pilot Project. Hypotheses were formulated on these 14 scales and tested for statistically significant differences.

In determining classroom teaching activities in accordance with the 14 observation scales of IOTA each teacher's performance was measured against accepted criteria rather than against the performance of other teachers. This approach to assessment is analytical as opposed to comparative, objective as opposed to subjective, and specific as opposed to general. Teacher competence is based on verifiable data secured through classroom observations made by trained observers.

I. PROBLEM

The purpose of this study was to determine if participants enrolled in a three semester on-site teacher preparation sequence would demonstrate significant differences in classroom teaching activities from those students enrolled in a one semester on-campus and two semester on-site teacher preparation sequence.

II. HYPOTHESES TO BE TESTED

The following null hypotheses tested in this study were related to the pre-service teacher's demonstration of classroom behaviors characteristic of professional teachers as defined and measured by the 14 observation scales of IOTA (see Appendix A).

Hypothesis 1--There is no significant difference between the mean behavior of Group A and Group B as measured by Scale 1 (Interest Centers) of IOTA.

Hypothesis 2--There is no significant difference between the mean behavior of Group A and Group B as measured by Scale 2 (Variety in Activities) of IOTA.

Hypothesis 3--There is no significant difference between the mean behavior of Group A and Group B as measured by Scale 3 (Use of Materials for Instruction) of IOTA.

Hypothesis 4--There is no significant difference between the mean behavior of Group A and Group B as measured by Scale 4 (Classroom Control) of IOTA.

Hypothesis 5--There is no significant difference between the mean behavior of Group A and Group B as measured by Scale 5 (Learning Difficulties) of IOTA.

Hypothesis 6--There is no significant difference between the mean behavior of Group A and Group B as measured by Scale 6 (Individualization of Instruction) of IOTA.

Hypothesis 7--There is no significant difference between the mean behavior of Group A and Group B as measured by Scale 7 (Development and Implementation of Classroom Goals) of IOTA.

Hypothesis 8--There is no significant difference between the mean behavior of Group A and Group B as measured by Scale 8 (Opportunity for Participation) of IOTA.

Hypothesis 9--There is no significant difference between the mean behavior of Group A and Group B as measured by Scale 9 (Exploration of Value Judgments) of IOTA.

Hypothesis 10--There is no significant difference between the mean behavior of Group A and Group B as measured by Scale 10 (Creative Expression) of IOTA.

Hypothesis 11--There is no significant difference between the mean behavior of Group A and Group B as measured by Scale 11 (Development of Student Initiative) of IOTA.

Hypothesis 12--There is no significant difference between the mean behavior of Group A and Group B as measured by Scale 12 (Social Climate) of IOTA.

Hypothesis 13--There is no significant difference between the mean behavior of Group A and Group B as measured by Scale 13 (Subject Matter Preparation) of IOTA.

Hypothesis 14--There is no significant difference between the mean behavior of Group A and Group B as measured by Scale 14 (Current Application of Subject Matter) of IOTA.

III. DEFINITION OF TERMS

Observation--the act of viewing instructional situations directly or via closed circuit television for the express purpose of developing insights and understandings of the nature of the learner, the learning process and the specific role of the teacher.

Participation--Involvement in instructional situations which was guided by supervising teachers. Participation was the primary technique used in Group A of the Pilot Project.

Pilot Project--An instructional program in secondary education to replace the entire 22 semester hours of the professional education sequence regularly taught in the College of Education. The program was composed of three different sequences or combinations of observation-participation experiences in the public schools and on-campus classwork with emphasis on development of teaching skills. Each phase of the project will be explained in detail in the text of Chapter III of this study.

Seminars--Periodic meetings with Group A and Group B students for the purpose of providing opportunities for discussion of content of the selected readings and laboratory experiences between students and between professors.

On-site and Laboratory experiences--These terms are used interchangeably and include all actual practices away from the college campus, within schools or environments, involving teacher education.

Several references are made which refer directly to the use of IOTA and need explicit definition. All of the following definitions pertaining to IOTA were quoted from The Evaluation of Teaching Competence: Workshop Manual.[8]

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[8] R. Merwin Deever, Howard J. Demeke, and Roy E. Wochner, The Evaluation of Teaching Competence: Workshop Manual (Tempe, Arizona: Arizona State University, 1970), p. 18.

Instrument--Instrument for the Observation of Teaching Activities, IOTA, consists of 27 scales which define the professional task of the teacher and provides the basis for assessing the classroom behaviors of teachers.

Scale--Each scale identifies a specific factor which was either essential in the teaching and learning processes and observable in the classroom or was indicative of the teacher's professional stature as perceived through interviews.

Item--Each scale was composed of five items which set forth, in behavioral terms, five levels of teaching behavior ranging from highly desirable to mediocre.

Observation scale--Each of the 14 observation scales was a description of teacher and/or student classroom performance, which could be observed or heard in the course of classroom visitation.

IV. LIMITATIONS

1. The population of this study was limited to pre-service secondary candidates enrolled in the three semester Pilot Project in the Secondary Education Department at Arizona State University.

2. The Project was comprised of a volunteer population.

3. The assessment of pre-service teaching behavior was limited to two 45-minute observations of the teaching activities of the Pilot Project participants.

V. SIGNIFICANCE OF THE STUDY

The Pilot Project in Secondary Education at Arizona State University was developed in an attempt to meet changing teacher education needs. In 1967 members of the Secondary Education Department decided to carefully examine and improve departmental offerings. With this in mind a four-man committee was established and given the responsibility of coordinating departmental efforts to attain this goal. Through the efforts of this curriculum committee and other committees from the Secondary Education Department an educational point of view and a statement of teacher roles, characteristics and competencies were developed and approved. In this developmental process, a pilot project emerged to test the ideas for implementing the behaviors associated with the teacher roles and competencies defined. At the time of this study the Pilot Project involved approximately 5% of the 2,000 students enrolled in the Secondary Education Department.

The intent of the investigator was to provide direct feedback to the administrators of the program and the members of the Secondary Education Department as to the effectiveness of producing desired classroom behaviors in pre-service trainees involved in the Pilot Project. The data from this study and companion studies may provide a viable framework on which to improve the preparation program for secondary teachers at Arizona State University and other institutions which have similar teacher education programs.

VI. SUMMARY

Chapter I introduced the reader to the stated purpose of the experimental study. The hypotheses to be tested were presented, as well as the significance and need for the study. Also included were the definitions of terms and limitations inherent in the study.

Chapter II is a selected review of the literature including pertinent studies, readings concerning the need and importance of the laboratory experience, and a review of the literature concerning the rationale for the use of the selected observation technique for data gathering, the IOTA.

The research design of the study is discussed in Chapter III. Also included are activities and procedures, sources of data, instrument construction and validation and the treatment of the data.

Chapter IV consists of an analysis of the data with appropriate tables.

Chapter V includes a summary, conclusions and recommendations.

CHAPTER II

REVIEW OF THE RELATED LITERATURE

In this chapter literature was reviewed in two areas of the problem of this investigation. The first of these areas was concerned with the establishment of on-site experiences, the need for extended on-site experiences, and research literature on extended laboratory experiences.[1] The second area was concerned with direct observation of teaching activities, and specifically with the use of IOTA as a method of assessing teaching by systematic observation of the teaching activities of student teachers.

I. ESTABLISHMENT OF ON-SITE EXPERIENCES

The first American "normal" school was established in 1839 and had a minimal one year curriculum which included a thorough review of common subjects, some secondary school academic subjects, the over-all development of the child, the principles and methods of teaching the subjects, common to the curriculum, the art of school

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[1]This area of Chapter II was co-authored with, and appears in D. Jacobsen, "An Assessment of the Effects of Two Experimental Arrangements on the Verbal Behavior of Student Teachers" (unpublished Doctor's dissertation, Arizona State University, 1970).

government, and practice teaching.[2] Throughout its period of growth, institutions involved with preparing individuals to teach have generally agreed that the experiences found in the professional sequence may be grouped into several major categories which include introductory courses in education, psychological foundations of education, historical and social foundations of education, philosophical foundations of education, curriculum courses, methods courses, and professional laboratory experiences. Harper supplied the following picture of laboratory experiences in the last third of the nineteenth century:

> As we have seen, the model and practice schools became the most distinctive trait of the normal school. The training school was recognized as the focal point of the entire process and here all the theory and subject matter taught was to find its application and crucial test. It was argued as to whether the practice school should be entirely under the control of the normal school or whether practice teaching should be done in connection with regular or city school systems. It was also pointed out that the model and experimental schools should be developed to test and demonstrate new and better techniques and teaching materials as well as providing a direct learning laboratory for students preparing to be teachers.[3]

The need for direct laboratory experiences was recognized by educational planners in Rhode Island. As early as 1893 journals and publications were prepared to inform the teachers of a model

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[2]L. Cremin, "Background of Teacher Education for U. S. Public Schools," The Education of Teachers in England, France, and the U. S. A., ed. C. A. Richardson H. Brule, and H. Snyder (Paris: UNESCO, The United Nations, 1953), p. 229.

[3]C. Harper, A Century of Public Teacher Education (Washington D. C.: American Association of Teachers Colleges, 1931), p. 118.

school being established to provide the opportunity for teachers to observe theories in practice.[4] As Hermanowicz pointed out, experiences in schools with children always have been a significant element in teacher education.[5] He warned, however, that the danger existed that direct experiences could become mere contacts with schools and children and afford little opportunity for practical applications.

One of the first educators to recognize the need for practice work in teacher preparation was John Dewey. However, in contrast to the purpose of direct experience as simply that of acquiring techniques, Dewey proposed:

> On the other hand, we may propose to use practice work as an instrument in making real and vital theoretical instruction; the knowledge of subject matter and of principles of education. This is the laboratory point of view . . . Practice work thus considered as administered primarily with reference to the intellectual reactions it incites, giving the student a better hold upon the educational significance of the subject matter he is acquiring, and of the science, philosophy, and history of education.[6]

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[4]J. McAllister, "Glimpses of the Past," Forty-first Yearbook of the Association for Student Teaching (Dubuque, Iowa: Wm. C. Brown, Co., 1962), p. 7.

[5]H. J. Hermanowicz, "The Professional Education of Teachers," Concern for the Individual in Student Teaching, ed. A. C. Haines (Dubuque, Iowa: Wm. C. Brown, Co., 1962), p. 65.

[6]J. Dewey, "Relationship of Theory to Practice in Education," The Relation of Theory to Practice in Education, ed. A. C. Haines (Cedar Falls, Iowa: The Association for Student Teaching, 1962), pp. 21-23.

Dewey formulated a sequence for on-site experience which began with the practice school being used mainly for the purposes of observation and reflection.[7] Secondly, there was a period of intimate introduction in which the student did not undertake much direct teaching but made himself useful in helping the regular class instructor. The third stage involved a transition from psychological and theoretical insight to the observation of the more technical points of class teaching and management. The fourth and final step was that of direct involvement in actual teaching with a minimum amount of supervision with the experience being extensive and continuous.

Throughout the first half of the twentieth century, normal schools provided direct experiences with children during the teacher education program. It remained, however, for the Flowers Report, sponsored by the American Association of Teachers Colleges, to influence schools toward the use of a systematic sequence of direct experiences with young people in school and community settings as an essential part of the teacher education curriculum.[8]

Dominant changes in teacher education programs in relatively recent years have reflected the influences of the Association for Student Teaching, the National Commission on Teacher Education and

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[7] Ibid.

[8] J. Flowers, School and Community Laboratory Experiences in Teacher Education (Oneonta, New York: American Association of Teachers Colleges, 1948), p. 261.

Professional Standards, the Progressive Education Association and other varied sources. Two dominant trends were noted in a close examination of the innovations incorporated into revised programs of teacher education: (1) provision of more professional laboratory experiences, and (2) an extension of professional laboratory experiences into the earlier phases of preparation of the pre-service teacher curriculum.[9]

Observation and careful study of youth at all stages of development are now requirements in most programs of teacher preparation. Throughout the professional preparation courses, beginning in the freshman year in many institutions, students are brought in contact with the many forces which affect the learning environment. These principles of learning must be understood in terms of how they function in realistic situations with pupils in the classroom. Thus, teacher preparation courses are planned to include extended opportunities for observation and participation prior to the student teaching experience.[10]

The vigorous efforts of the American Association of Teachers Colleges (subsequently the AACTE) and the Association for Student Teaching to implement the recommendations of the Flowers report were

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[9] E. Watters and J. Halsted, "Changes During the Recent Years," Forty-first Yearbook of the Association for Student Teaching (Dubuque, Iowa: Wm. C. Brown, Co., Inc., 1962), p. 36.

[10] Ibid.

effective in bringing about some fairly substantial changes in the program of professional laboratory experiences.[11] The major developments may be summarized as follows:

1. Laboratory or campus schools were utilized more intensively for pre-student teaching laboratory experiences and much less commonly for student teaching.

2. The movement toward scheduling student teaching as a full-time experience over a period of weeks and away from one or two daily assignments was accelerated.

3. Community agencies and neighborhood schools were used to a greater extent for pre-student teaching experiences.

4. Relatively minor advancements were made in post-student teaching laboratory experiences.

Although major categories in teacher preparation programs are generally agreed upon, teacher education institutions have developed numerous patterns in the undergraduate curriculum. Some include all categories as separate units while others combine many of the theoretical aspects of pre-service preparation. Some fuse introductory courses and laboratory experiences while others simply rearrange the sequence of the curriculum. However, it is a common practice in undergraduate teacher education to have students complete most, if not all, of the sequence prior to student teaching.[12]

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[11] E. Pogue, "Student Teaching: The State of the Art," Innovative Programs in Student Teaching, ed. R. Edelfelt (Baltimore, Maryland: Maryland State Department of Education, 1968), p. 19.

[12] Hermanowicz, op. cit., p. 67.

Need for Extended On-site Experiences

Professional education suffers from a lack of training programs which are related to actual on-site experiences. Koerner pointed out that there is what can only be called an appalling lack of evidence to support the wisdom of professional training for teachers which fails to undertake the problem of relating the curriculum to actual performances.[13] This does not mean that professional training has no value. It means that, until a reliable method is developed for connecting the training program with the on-the-job performance of teachers, there should be much less rigidity in those programs and much more modest claims made for them.

During the past two decades professional laboratory experiences have been ascribed an increasingly significant role in the preparation of professionally competent teachers. They are deemed essential to the synthesis of ideas, insight, understanding, attitudes, sensitivity, and skills which underlie and are reflected in teacher's judgments, actions, general behavior, or performance. Professional laboratory experiences which provide opportunity for purposing, involvement, the development and testing of action schemes, and the scrutiny of outcomes and re-setting of purposes, strengthen the likelihood of developing reasoned understandings. The concept of the role of personal meaning in learning is particularly significant to the experience of those who are to guide others in learning and

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[13] J. D. Koerner, The Miseducation of American Teachers (Boston: Houghton-Mifflin Company, 1963), p. 16.

can be enhanced by observation and participation experiences of an extended direct nature.[14]

There is an increasing emphasis in teacher education upon the use of extended laboratory experiences as a vital and perhaps single most important part of teacher education. J. Lloyd Trump, in outlining guidelines for teacher education, stressed the need for early and continuous laboratory experiences and for an integrated effort on the part of all concerned. He wrote:

> Over a five year period, the essential knowledge in liberal arts, subject matter, and in education will be studied and discussed by the prospective professional teachers in conjunction with actual on-the-job experience. Thus teachers can be taught as they will be expected to teach. The program will bring together realistically the various ingredients for the making of a professional teacher: the schools; the universities; state departments of education and the United States Office of Education; and the various related professional organizations.[15]

Most teacher-education programs have become committed to the idea that pre-service students should be involved with children. Combs asserted that for the most part this is brought about through observations, limited forms of participation in the classroom, and finally in the internship.[16] He continued that since children are the raw material with which teachers must eventually work, it would

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[14] H. Suchora, "Teacher Education: The Context for Professional Laboratory Experiences," The Outlook in Student Teaching, Forty-first Yearbook of the Association for Student Teaching (Dubuque, Iowa: Wm. C. Brown, Co., Inc., 1962), p. 131.

[15] J. Lloyd Trump, "The Education of A Professional Teacher," Phi Delta Kappan, 44,9:49, June, 1964.

[16] A. W. Combs, The Professional Education of Teachers (Boston: Allyn and Bacon, Inc., 1965), p. 30.

appear we could profit from a great deal more involvement with children outside as well as inside the classroom. We need to find ways of involving students in all kinds of settings, depending upon what it is they are getting ready for. Combs concluded that it is apparent that teacher-training curricula must go very much further in the direction of providing and supervising opportunities for commitment and involvement of their students.[17]

Anderson pointed out that educators have long recognized that the teaching process and the duties associated with teaching are best learned in the laboratory of the classroom and the school, working with children.[18] With regard to the high school of the future, Anderson stated that the school system itself will be an integral part of teacher education for all types of laboratory experiences from the person's high school days throughout his teaching career. The teaching of methods will be integrated with the on-site practical experiences of students in the public schools and supervision will be a cooperative responsibility among the teachers in the school, the teacher education co-ordinator, and the college faculty members. This will be the team that will provide for future methods "courses" that may not look like courses at all.[19]

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[17] Ibid., p. 29.

[18] V. E. Anderson, "Teacher Education for the High School of the Future," The High School of the Future: A Tribute to Kimball Wiles, ed. Wm. Alexander (Columbus, Ohio: Charles E. Merrill Publishing Company, 1969), p. 215.

[19] Ibid., p. 217.

There have been many reasons underlying efforts to increase the quantity and, particularly, the quality of professional laboratory experiences in teacher education. Some original concerns precipitating this movement were: (a) the dichotomy of educational theory and practices; (b) the need for applying principles of learning in terms of active, meaningful participation of prospective teachers throughout the professional sequence, and (c) the participation in, and study of, major teaching activities by teacher candidates.[20]

A major task of the professional laboratory experience is to provide opportunities for the continuous manifestation of intellectual breadth and understanding in situations where knowledge, insights, and attitudes can be identified, studied, analyzed, and synthesized. Experiences and literature in the field of teacher education reflect much activity and thought directed toward implementation of professional laboratory experiences. Much of this effort, however, has been restricted to that phase of teacher education which is usually identified as course work in professional education. These program designs seem to assume that students come with an adequate grasp and sufficient perspective of knowledge to guide the learning of developing minds. Teachers' rigid adherence to textbook content, to teacher guides, and to standards of academic progress reflect, to a degree, the lack of sufficient command of

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[20]The American Association of Teachers Colleges, School and Community Laboratory Experiences in Teacher Education (Oneonta, New York: The Association for Student Teaching, 1948), p. 6.

knowledge to deal with ordinary elements of subjects, to say nothing of the more searching questions and observations of children. The continuance of this limited approach to the professional laboratory experiences poses a threat to adequate teacher education. The concept of laboratory experience has yet to be creatively implemented in all phases of teacher education.

Experiences and current exhortations to improve teacher education demand more creative implication and better integration of the theory-practice-theory cycle which underlies the concept of the professional laboratory experience. Observation and participation should not depend on chance observations in classrooms. Laboratory experiences need to be redesigned if students are to study, analyze, and interpret adequately the roles of knowledge and the process of learning in the education of children.[21]

Research Literature on Extended Laboratory Experiences

A review of the literature revealed limited attempts to systematically study the practice-teaching experience. Blatt and Sarason stated that there has been much discussion on when the practice-teaching should occur, how long it should last, and the need for it to be a truly stimulating experience. However, even on the level of discussion, there has been little or no focus on the

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[21]H. Suchora, "Teacher Education: The Context for Professional Laboratory Experiences," The Outlook in Student Teaching, Forty-first Yearbook of the Association for Student Teaching (Dubuque, Iowa: Wm. C. Brown, Co., Inc., 1962), p. 131.

specific aims of the practice-teaching period and what actually goes on during this important phase of training.[22] Sandefur further reported that research which has attempted to test the effectiveness of the laboratory approach as the major means of providing professional education is virtually non-existent.[23]

Since 1965, there have been some researchers who have studied certain effects of extended laboratory experiences on pre-service teachers. Among them was Tressler who appraised the pre-service teaching offerings in the colleges and universities preparing teachers in Maryland.[24] The purpose of this study was to investigate the kinds of direct experiences offered to students in the 22 approved teacher education institution programs in Maryland. Data was secured from representatives of the approved education programs in Maryland, with a specific emphasis upon Hood College students and graduates, and cooperating teachers and administrators by using questionnaires and interviews. The study found that student-teaching programs in the approved teacher education institutions in Maryland

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[22] K. Sarason, K. Davidson, and B. Blatt, The Preparation of Teachers: An Unstudied Problem in Education (New York: John Wiley & Sons, Inc., 1962), p. 116.

[23] J. T. Sandefur, An Experimental Study of Professional Education for Secondary Teachers (Emporia, Kansas, Cooperative Research Project 2897, U.S.O.E., 1967).

[24] C. E. Tressler, "An Appraisal of the Hood College Junior Aide Program and the Pre-Student Teaching Experiences in the Approved Teacher Education Programs in Maryland" (unpublished Doctor's dissertation, George Washington University, 1967).

were diversified with the bulk of programs being identified with course work in professional education. With regard to the junior aide program at Hood College, an extensive list of experiences was identified by the students and graduates indicating the strengths and weaknesses of the program. According to the survey, the college students as well as the professional teachers involved in the program agreed that more time devoted to pre-student teaching experiences with children for the purposes of strengthening the Hood College program was imperative.

Thorman investigated the relative effectiveness of four methods of training prospective teachers in interpersonal skills.[25] The sample for the study consisted of 111 juniors enrolled in Education 55A, Introduction to Secondary School Teaching, at the University of Minnesota in 1968. Students were randomly assigned to one of four treatment groups involving a variety of activities. Thorman's findings reported that direct experiences in the classroom in which the prospective teachers were involved in face to face confrontations with other people were perceived by them as more valuable than academic experiences with similar objectives. Thorman further reported that direct experiences with youth of the type received by Group C, and extended laboratory experience in which trainees were working directly with secondary school age youngsters,

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[25] J. H. Thorman, "Relative Effectiveness of Four Methods of Training Prospective Teachers in Interpersonal Skills" (unpublished Doctor's dissertation, University of Minnesota, 1968).

was ranked by 61 percent of the students in the study as being the most valuable experience for prospective teachers.

Stromquist investigated the pre-student teaching laboratory experiences in the secondary schools of selected members of the North Central Association of Colleges and Secondary Schools and reported that as a whole the colleges and universities covered in the study were not providing the continuous, supervised and systematic programs of planned observation and participation experiences for their students.[26] The criteria used to make this generalization were based on publications of the National Council for Accreditation of Teacher Education, The National Commission on Teacher Education and Professional Standards, and the Association for Student Teaching which concerned provision of quality education for prospective teachers. The basic criteria considered were:

1. There should be a combination of direct experience and systematic study throughout the teacher education program.

2. Courses in the professional education sequence should provide laboratory experiences for all students prior to the student teaching experience.

3. Laboratory experiences should provide for the involvement of the student in a variety of situations with individual pupils and with groups of pupils.

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[26] M. H. Stromquist, "A Study of Pre-Student Teaching Laboratory Experience in Secondary Education Programs of Selected Colleges and Universities" (unpublished Doctor's dissertation, University of Kansas, 1965).

4. Supervision should be cooperatively planned by all professional persons who are involved in the experience, and should be based on the needs of the individual.

Stromquist indicated that the over-all picture from the data collected established wide-spread interest in providing extended laboratory experiences for students in secondary education programs. In this study he suggested that a provision be made for providing a systematic and continuous program of pre-student teaching laboratory experiences as well as more imaginative use of community resources to provide the pre-service teacher with direct experiences with secondary age students. Stromquist clearly estabslished that as a whole the college and universities sampled in the study were not providing for a continuous and planned observation and participation experience for secondary education students as outlined by the afore mentioned criteria.

In a North Dakota study Dahl concluded that student teachers as individuals do change their attitudes towards pupils during the laboratory experience.[27] Dahl contended that extended exposure of pre-service teacher trainees in a direct experience laboratory situation makes a significant difference in attitudes toward pupils and that student teachers will demonstrate considerable change in

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[27] I. J. Dahl, "Analysis and Evaluation of Certain Attitudinal and Behavioral Changes in Selected Student Teachers During the Professional Laboratory Experience with an Experimental Variable of Supervisory Personnel" (unpublished Doctor's dissertation, University of North Dakota, 1968).

the pattern of student teacher interaction during the professional laboratory experience. According to Dahl's findings some students gained as much as 75 raw score points on the Minnesota Teacher Attitude Inventory and were displaying more indirect teacher behavior in the classroom as measured by the Flanders' System of Interaction Analysis.

Preil investigated the relationship between time spent in direct laboratory experiences and teacher effectiveness. His study was conducted in nine varied school districts in New Jersey and provided supporting data for the hypothesis that beginning teachers with more time spent in laboratory experiences are more effective teachers than beginning teachers with fewer or no hours spent in a professional laboratory experience.[28] This was indicated at statistically significant levels for 14 of 23 teaching functions evaluated by principals.

McCreery analyzed the student teaching program at Ball State Teachers College and found that improvement could be brought about through pre-student teaching courses of a practical nature, a wider variety of experiences in student teaching and more direct experiences with children, and better relationships between students and their supervising teachers.[29]

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[28] J. J. Preil, "The Relationship Between Student Teaching and Teaching Effectiveness" (unpublished Doctor's dissertation, New York University, 1968).

[29] G. S. McCreery, "Analysis of the Student Teaching Program in Secondary Schools at Ball State Teachers College" (unpublished Doctor's dissertation, Indiana University, 1953).

Meade examined the relationship between the production of teachers by higher education and the consumption of teachers on the part of schools. His position was that in professions such as medicine, law, and business, the profession assumes the major responsibility for the clinical aspects of the professional preparation in real places and not entirely in artificial demonstration arrangements. In education, the school assumes only a minor role and responsibility for clinical training. As such, Meade proposed that the clinical phase of teacher education be preferably longer than half a school year and that all clinical training of teachers take place in a real school.[30]

Summary

It is widely recognized that the professional laboratory experience performs a crucial function in the undergraduate teacher education programs. The necessity for, and desirability of extended on-site experiences may be summarized by the esteem reserved for these programs by Conant, a critic of teacher education practices, who in recent statements proposed three requirements for the certification of teachers. In addition to the baccalaureate degree and the endorsement of the candidate's college or university, Conant would require:

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[30]E. J. Meade, "Student Teaching: Many a Slip Between the Cup and the Lip," Research and Professional Experiences in Teacher Education (Cedar Falls, Iowa: The Association for Student Teaching, 1963), pp. 25-34.

> . . . that he submit evidence of having successfully performed as a student teacher under the direction of college and public school personnel in whom the State Department has confidence, and in a practice teaching situation of which the State Department approves.[31]

In his recommendation 5, Conant added:

> The state should approve programs of practice teaching. It should, working cooperatively with the college and public school authorities, regulate the conditions under which practice teaching is done and the nature of the methods of instruction that accompanies it.[32]

Conant concluded that:

> I believe that if the state provides for a careful examination of the student teacher in the actual act of teaching it will have the most effective device by which to insure itself of competent teachers.[33]

Conant's remarks did not, of course, suggest all of the details necessary for a program of professional laboratory experiences. These details, however, have been described many times by individuals and organizations. What a program of professional laboratory experiences should include has been developed by the Association for Student Teaching in a recent yearbook:

> Student teaching, however, is often considered a major focal point in the professional sequence. The prospective teacher is to have extended, direct experience in the observation and performance of various teaching responsibilities. Supposedly under continuous, close supervision the student teacher is given increasing responsibility for working with learners during several consecutive weeks. Thus, it is assumed that the teacher candidate

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[31] J. B. Conant, The Education of American Teachers (New York: McGraw-Hill Book Company, 1963), p. 60.

[32] Ibid., p. 64.

[33] Ibid., p. 65.

> is essentially a student directly involved in the teaching-learning laboratory in which methodological planning, systematic observation, theory practice relationships, and critical evaluations are being experienced. Generally a seminar is conducted with student teachers to assure accomplishment of the purposes for this laboratory experience.[34]

In a short period of time, greater enrollment in teacher education programs accompanied by an emphasis on realistic direct experiences has forced the movement of student teaching from laboratory schools on campuses into off-campus cooperating schools.[35] An increased concern for continuous education and a desire to extend the period of supervised direct experiences has resulted in internships and other modifications and experimentation with the course offerings and sequences of teacher training programs. The traditional or usual form of student teaching is being replaced in many instances. The move to more and more direct experiences with children as a means for preparing prospective teachers has created new positions such as clinical professors and clinical associates to go along with the new programs in an attempt to improve the caliber of teachers being produced.

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[34] H. J. Hermanowicz, "The Professional Education of Teachers," Concern for the Individual in Student Teaching, ed. A. C. Haines (Dubuque, Iowa: Wm. C. Brown, Co., 1962), pp. 66-67.

[35] D. Corrigan and C. Garland, Studying Role Relationships (Dubuque, Iowa: Wm. C. Brown Co., Inc., 1966), p. 1.

II. DIRECT OBSERVATION OF TEACHING ACTIVITIES

The importance of laboratory experience programs leads to fundamental questions regarding the nature of the measurement of effective teaching that student teachers are supposed to master in the course of the laboratory experience.

The nature of the difficulties inherent in a definition of effective teaching or teacher competence is explored in a broad treatment by Mitzel in the Encyclopedia of Educational Research.[36] He affirmed the observation of others when he said, ". . . teacher effectiveness as a concept has no meaning apart from the criterion measures or operational definitions of success as a teacher."[37]

Mitzel classified criteria as product, process or presage. Product criteria relate to such items as measurement of pupil achievement, gains or growth. The difficulties involved in relating specific teaching efforts to specific pupil gains has been attested to by the relatively few efforts attempted in this area. Presage criteria, involving variables such as intelligence or attitude of the teacher are removed from the teaching situation and classroom interaction, and involve presumed product and process relationships. Research efforts in the past have frequently dealt with presage criteria.

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[36]Harold Mitzel, "Teacher Effectiveness," Encyclopedia of Educational Research (New York: The Macmillian Co., 1960), pp. 1481-86.

[37]Ibid., p. 1482.

It is in the area of process criteria that some significant research advances have been accomplished in recent years. Process criteria relate directly to the teaching process and include variables that lie in the domain of teacher behavior and teaching activities in the classroom situation. Among the limitations encountered in the use of process criteria are the difficulties involved in recording "live" behavior and categorizing it objectively and reliably.

It is apparent from the studies of Flanders, Medley, Mitzel, Smith, Bellack, Withall, Ryans, and others that comprehensive and significant research in the area of teacher behavior, and attempts to define effective teaching, have been initiated in recent years. With the exception of the Ryans study, the efforts stated have in common the employment of what Mitzel has termed process criteria.[38] They have been concerned with the recording of teacher behavior during the process of teaching. They have attempted to define effective teaching and effective teachers in terms of specific behaviors observable in the context of classroom activities.

In describing the assessment of classroom behavior of teachers, Ryans stated that:

> . . . teacher behaviors and activities are capable of operational definitions. Implied in this approach is the assumption that a teacher may be described in terms of positions on specified behavior dimensions, such descriptions being essentially factual and relating to observable manifestations of overt behavior or

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[38] Ibid., pp. 1481-86.

> else to responses known to be correlated with some behavior pattern to a degree that may permit indirect estimation of that behavior.[39]

The assessment of teacher behavior is concerned with the identification and classification of the interrelationships among teacher characteristics and behaviors. Teacher behavior assessment involves judgments of the quality of teacher behaviors, judgments which of necessity must be made in light of agreed-upon educational objectives, expectancies of individuals and groups, and other evaluative criteria approved by the College of Education in which a particular teacher is trained. Teacher preparation institutions do need to raise questions about good and poor teaching and to give careful attention to what "good" and "poor" means in the context of particular value systems, and to identify teachers whose performances are characterized as superior or inferior with respect to the accepted context.

In commenting upon teacher effectiveness research Ryans refers to an "evaluation research paradigm."[40] The steps involved in this paradigm are not particularly unique. Applied to teacher competency evaluation and assessment they are:

1. Identification of the properties of teacher behavior; the description of teacher behavior.

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[39]David G. Ryans, Characteristics of Teachers: Their Description, Comparison and Appraisal (Washington, D. C.: American Council on Education, 1960), p. 77.

[40]"Theory Related to Professional Laboratory Experiences in Teacher Education," Forty-fourth Yourbook of the Association for Student Teaching (Dubuque, Iowa: Wm. C. Brown, Co., 1965), p. 16.

2. Selection of a criterion framework, this being subjective and a matter of the value system or systems different individuals or groups may agree upon or possess in common.

3. Identification of the particular kinds of situations in which the agreed-upon valued behavior is to be assessed or predicted.

4. Operational description of the agreed-upon criterion behaviors that the researcher or practioner wishes to assess in teachers.

5. Conduct of research on relationships between selected, operationally defined properties of teacher behavior in the selected situations.

These are necessary steps before reliable and useful assessments of teacher competency can be properly and successfully accomplished.

The Competencies Approach to Teaching

A specific approach used for defining good teaching has been in terms of teacher "competencies." The thinking behind this approach is based on the idea of knowing what the expert teachers do, or are like. This is a straightforward, uncomplicated approach to the problem of teacher training. This idea has produced great quantities of research into the traits of good teachers and their methods.

First attempts to describe specifically the competencies of good teachers yielded very few useful results. In 1929 the American Association of School Administrators conducted a study to provide

data to help them make practical decisions about teacher quality necessary in carrying on their jobs. The study showed that there was no specific trait or method exclusively associated with good teaching.[41]

Since this early investigation researchers have thought that better discriminations might result from studying the general, rather than the specific, traits or methods of good teachers. Approaching the problem in this way, researchers have been able to find fairly stable distinctions in such general terms as good teachers are "considerate" or "child centered" or "concerned about structure." The most significant study of this type was a study by Marie Hughes.[42] Hughes developed an exhaustive system for analyzing teacher behavior and applied this system to time-sample observations of teachers in the classroom. She was able to demonstrate a number of general classes of behavior seemingly characteristic of good teachers. Among these were such categories as controlling, imposition, facilitating, content development, response, and positive and negative

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[41]W. J. Ellena, M. Stevenson, and H. V. Webb, Who's A Good Teacher? (Washington, D. C.: American Association of School Administrators, National Education Association, 1961).

[42]Marie M. Hughes, Development of the Means for Assessing the Quality of Teaching in Elementary Schools, Report of Research, Cooperative Research Program, Project No. 353 (Washington, D. C.: United States Office of Education, 1959).

affectivity. Similar attempts to analyze teacher behavior have been carried out by Flanders,[43] Smith,[44] Medley and Mitzel,[45] Bellack,[46] and Taba.[47]

Braunfield[48] pointed out that specifying criteria of satisfactory student performance is an essential step in promoting efficient progress in teacher preparation. Instructional goals, identification of roles and specification of characteristics of competent professional teaching behavior, regardless of the procedures by which they are achieved, are most efficiently stated in behavioral terms. Clearly delineated behavior provides a basis for evaluation and assessment which is both readily apparent and easily distinguished. Lumsdaine[49] pointed out that progress in research can be achieved

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[43]N. A. Flanders, Teacher Influence, Pupil Attitudes and Achievement: Studies in Interaction Analysis, Final Report, Cooperative Research Program, Project No. 397 (Washington, D. C.: United States Office of Education, 1960).

[44]Othaniel Smith, "A Concept of Teaching," Language and Concepts in Education (Chicago: Rand McNally, 1961).

[45]Donald M. Medley and Harold E. Mitzel, "A Technique for Measuring Classroom Behavior," Journal of Educational Psychology, 49:86-92, 1958.

[46]Arno A. Bellack, et. al., The Language of the Classroom (New York: Teachers College Press, 1967).

[47]Hilda Taba, "Teaching Strategies for Cognitive Growth," Conceptual Models in Teacher Education (Washington, D. C.: American Association of Colleges for Teacher Education, 1967), pp. 16-26.

[48]Peter G. Braunfield, "Problems and Prospects of Teaching with a Computer," Originally appeared in the Journal of Education Psychology, 55,4:201-11, 1964.

[49]Arthur A. Lumsdaine, "Improving the Quality and Relevance of Research on Teaching," Improving College Teaching, ed. Calvin B. T. Lee (Washington, D. C.: American Council on Education, 1967).

only as dependent measures of the outcomes of teaching in terms of observed changes in student behavior are developed. Mager[50] in a more definitive discourse, demonstrated how competencies in stating behavioral goals where achievement of terminal behavior is overtly demonstrated, may be developed. Particularly pertinent is the work of Mechner[51] who stated that behavioral analysis provides for identification of specific skills and knowledge components and shows the need for sequence to promote effective learning.

Ward and Schalock[52] point out a definite trend toward a competency or performance based, field centered approach to teacher preparation in which teachers should be able to demonstrate that they are capable of performing the various functions required of them before they assume the responsibility for doing so. Ward and Gubser[53] further stated that clinical experiences which enable prospective teachers to work directly with children and youth have consistently been appraised by those who participated in them as the most valuable

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[50]Robert F. Mager, Preparing Instructional Objectives (Palo Alto, California: Fearson Publishers, 1962).

[51]Francis Mechner, "Behavioral Analysis and Instructional Sequencing," Programmed Instruction, Yearbook of the National Society for the Study of Education, Part II, 1967, p. 82.

[52]William Ward and Del Schalock, "Performance Based Instruction: Implications for Program Operation and Personnel Development," Selected Convention Papers: 47th Annual International Convention (Washington, D. C.: Council for Exceptional Children, 1964), pp. 10-20.

[53]William Ward and Joy Gubser, "Developing the Teaching Internship Concept in Oregon," The Journal of Teacher Education, 15:252-63, September, 1964.

experiences provided by the teacher training institutions to develop the competencies needed to perform the tasks of teaching. In reference to the tasks and roles of teachers, Rosove[54] and others at the System Development Corporation have made this an area of concern in the form of contextual mapping to better define the role of future teachers. Kahn and Weiner[55] listed 92 technical innovations in education likely to occur by the year 2000 that will greatly influence the role and needed competencies of teachers. Shane,[56] King,[57] Goodlad,[58] and Shoben[59] have shown that the tempo of change will steadily increase in public education requiring increasingly different kinds of competencies to perform the task of teaching. Howsam suggested that since it is not presently feasible to rely on an ultimate criterion

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[54]Perry E. Rosove, "An Analysis of Possible Future Roles of Educators as Derived from a Contextual Map" (Santa Monica: System Development Corporation, 1968), mimeographed.

[55]Herman Kahn and Anthony Weiner, The Year 2000: A Framework for Speculation and the Next 33 Years (New York: McMillian Co., 1967).

[56]Harold Shane, "Future Schock and the Curriculum," Phi Delta Kappan, 49:67-70, October, 1967.

[57]S. L. Kong, "Education in the Cybernetic Age: A Model," Phi Delta Kappan, 49:71-74, October, 1967.

[58]John Goodlad, "Learning and Teaching in the Future," National Education Association Journal, 57:49-51, February, 1968.

[59]Edward Shoben, "Education in a Megapolis," Educational Forum, 31:431-39, May, 1967.

of teacher effectiveness or behavior, it becomes necessary to develop intermediate or proximate criteria.[60]

Wiles[61] stated that each institution should declare the competencies sought. Hypotheses of desired teacher behaviors should be stated; this step is necessary if valid judgments are to be made about the effectiveness of a given program in producing the desired type of teachers.

The position of the Secondary Education Department at Arizona State University contended that effective teaching is a combination of skills, understandings, attitudes, and values which are developed through an experiencing process where the individual has the opportunity to learn, try out and apply what he is learning, and interact with others concerning the personal meaning of teaching.[62]

In a preliminary report of curriculum development procedures from the Secondary Education Department, Bell, Bell and Griffith indicated that, "emphasis will be upon development of the knowledge and competencies necessary for successful classroom teaching, not upon time spent in a particular course or activity," and that "Students

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[60]Robert Howsam, "Teacher Evaluation: Facts and Folklore," National Elementary Principle, 43:15, November, 1963.

[61]Kimball Wiles, "The Teacher Education We Need," The Journal of Teacher Education, 17:262, Summer, 1966.

[62]James Bell, John Bell, and LeRoy Griffith, "Pilot Project in Secondary Teacher Education" (mimeographed, Arizona State University, 1969).

who do not acquire the necessary competencies in the normal amount of time will be required to remain in that phase until the requirements have been met."[63]

The approach to be taken in this study will be to utilize an intermediate specified criterion, The Instrument for the Observation of Teaching Activities, to assess characteristics of teacher behavior that are observable in the classroom. Rose has stated that the concept of role, which is the basis of the IOTA, provides a natural framework from which to view teaching because it is task and function oriented.[64]

Kinney, Kallenback, Bradley, Owen, and Washington have advanced the California Definition[65] of teaching competency to include all of the teaching activities and teacher behaviors exhibited in the classroom.

IOTA was first developed as an evaluative research instrument to compare the competence of experimental groups in teacher education programs with those in regular programs.[66] It is now in common use

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[63]Ibid.

[64]Gale W. Rose, "Performance Evaluation and Growth in Teaching," (unpublished paper presented at the Advanced Administrative Institute, Harvard University, 1961).

[65]California Teachers Association Commission on Teacher Education, Teacher Competence: Its Nature and Scope (San Francisco: The Association, 1957), pp. 31-42.

[66]Lucien Kinney, et. al., "A Criterion for the Appraisal of Student Teaching: The California Definition," Evaluating Student Teaching, Thirty-ninth Yearbook of the Association for Student Teaching (Dubuque, Iowa: William Brown Co., 1960).

as a means for enhancing the quality of instruction in school systems in Arizona, California, Hawaii, Kansas, Texas, Utah, Iowa, Nevada, and Washington.

The efficiency of IOTA for self-evaluation by teachers and for cooperative evaluation by teachers and supervisors, depends on the quality of measurements obtained through its use. It is important, therefore, to consider the available evidence on the characteristics of the instrument. These characteristics are equally important when the instrument is used in experimental programs.

Following the general outline of procedures developed in the Hawaiian experimentation and the guidelines set forth in experimentation in the San Francisco City Schools, Kinney summarized the development of the instrument as follows:

> 1. The California Definition, adjusted to the local philosophy, provides a useful framework for constructing an effective instrument for directing observation.
>
> 2. Following established procedures it is practical for a local staff, starting with the California Definition, and using the instruments already prepared as a model, to develop instruments adapted to local philosophy, which observers may be trained to use.
>
> 3. With the forms that have been developed, the (IOTA) instrument has become an efficient and economical means for evaluating teacher performance.
>
> 4. With properly trained observers, measurements secured through use of the (IOTA) instrument have a high degree of consistency and adequate discriminative ability.[67]

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[67] Lucien B. Kinney, "Developing Instruments to Direct Appraisal of Teaching Effectiveness" (Tempe, Arizona: Bureau of Educational Research and Services, Arizona State University, 1962) (mimeographed).

Before a function can be measured it must first be defined. The importance that this definition assumes as a criterion in experimental program development has only recently been emphasized by researchers in the field of teacher education. A synthesis of the viewpoint expressed by two major committees concerned with these requirements indicates that any definition before it is accepted as a criterion, should reveal these characteristics:[68]

1. It will be socially valid and justifiable.
2. The function defined will be stable. If measurements are accurate, the performance will be essentially the same from one time to the next.
3. There will be variability within the population with respect to the function defined.
4. The definition will be conceptualized. It must present a clear and accurate concept of the variable being defined.
5. The scope of the data relevant to the function being defined will be apparent.

The term "instrument," as used here, should be understood to include (1) the observers using the instrument, and (2) a variety of procedures essential to its development and administration. IOTA is actually a general term, incorporating several standard features:[69]

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[68] American Educational Research Association, "Report of the Committee on Teacher Effectiveness," Review of Educational Research, 22:238-61; see also
John C. Gowan, "Prediction of Teaching Success: Rating by Authority Figures," California Journal of Educational Research, 6:147-53, September, 1955;
Lucien B. Kinney, "New Horizons for Research," The Journal of Teacher Education, 5:289-92, December, 1954;
Harry Levin, "A New Perspective on Teacher Competence Research," Harvard Educational Review, 24:98-105, Spring, 1954;
William Rabinonitz and Robert Travers, "Problems of Defining and Assessing Teacher Effectiveness," Educational Theory, 3:212-19, July, 1953.

[69] Lucien Kinney and Warren Kallenbach, "The Quality of Measurements Obtained Through Use of IOTA" (mimeographed, San Jose State College, 1969).

1. An instrument to direct observation, consisting of scales derived directly from the definition of the role of the teacher, as outlined in a current publication of the Arizona IOTA Council[70] and also by the Secondary Education Department at Arizona State University.[71]

2. Continual study of the criterion and the instrument to adapt the latter more closely to the local philosophy.

3. Utilization of the instrument by observers carefully trained in its use.

Experience with the IOTA instrument has revealed that revision of some items is necessary to improve clarity and to make provision for recording significant data that had not been anticipated in earlier development and revision of the instrument. After the last revision, 1970, by the Arizona IOTA Committee it is concluded that:

> 1. It is possible to develop a discriminating, valid, and economical instrument to measure the product of a program against its criterion.
>
> 2. The instrument is sufficiently discriminating to measure growth adequately to monitor program development.[72]

The remainder of this study attempted to determine whether a significant difference existed in the classroom teaching activities

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[70] Ibid.

[71] Bell, Bell, and Griffith, loc. cit.

[72] Lucien Kinney, et. al., "A Criterion for the Appraisal . . . ," op. cit., p. 56.

of two experimental arrangements of pre-service secondary teachers. Chapter III contains a detailed explanation of the construction and validation of the instrument, IOTA, as well as a discussion of the research design and procedures employed in the present study.

CHAPTER III

RESEARCH DESIGN AND PROCEDURES

I. INTRODUCTION

The purpose of this study was to determine if participants enrolled in a three semester on-site teacher preparation sequence would demonstrate significant differences in classroom teaching activities from those students enrolled in a one semester on-campus and two semester on-site teacher preparation sequence. The IOTA was used to gather data on classroom teaching activities. For the convenience of the reader Chapter III is divided into the following headings: (1) Population, (2) Activities and Procedures, (3) Instrument Construction and Validation, (4) Experimental Design, and (5) Treatment of the Data.

II. POPULATION

The population of this investigation consisted of the students in the experimental Pilot Project. Students in the Pilot Project were those undergraduate students who volunteered to participate in the project, had no previous courses in professional education, and had entered the teacher education program at the junior level or above. Students were randomly assigned to treatment groups A and B

comprised of 19 and 20 students respectively. The randomization process is explained in detail under the section on experimental design.

III. ACTIVITIES AND PROCEDURES

The experimental Pilot Project began in the second semester of the 1968-69 academic year with the administration of the Minnesota Teacher Attitude Inventory, the Allport-Vernon Scale of Values, the Personal Orientation Inventory, and a semantic differential to Group A and Group B. After these testing procedures had been completed, both groups began their individual sequences.

Students randomly assigned to Group A began their professional education sequence in an on-site program which consisted of participation and observation in selected secondary schools, seminars held at the on-site locations or at Arizona State University, and individualized reading materials correlated with the on-site experiences. Twenty-five sets of instructional materials called Mini-pacs were developed by the Secondary Education Department for use by the Pilot Project students. The Mini-pacs are based on the teacher roles which are included in Appendix A. By completing some of the selected readings and activities included in the Mini-pacs, the prospective teachers should be better able to perform their teaching roles. Each student in Group A spent a minimum of nine hours per week in participation/observation situations and on-site seminars and received seven hours of credit for successful completion of the first semester of the experimental program.

The data presented in Table 1 reveals the variety of student participation in the on-site experiences for the first semester. Seminars were designed to provide material which was parallel to the on-going practical experiences and stimulate in-depth discussions on issues deemed relevant to effective teaching. The first topic for discussion concerned how to work with cooperating teachers. This seminar was followed by investigating and determining significant things to observe and to plan for the most efficient way to incorporate these observation objectives into a technique for actual classroom observation. Attention was then focused upon delineation of the nature and needs of the adolescent and identifying special problems which face these students. The final topic discussed in the seminars for Group A during the first semester of the project involved an in-depth view of the nature of teaching. Outside readings were used to provide a foundation and supplement for this topic as well as for the other topics discussed in the seminars held throughout the semester.

Students randomly assigned to Group B began their professional sequence enrolled in a course held on campus at Arizona State University. Students in Group B participated in seven hours of on-campus activities per week and received seven hours of academic credit for the successful completion of the first semester of the Pilot Project.

Class activities for Group B are listed in chronological order in Appendix B. This listing is an actual account of the

Table 1

Variety of Activities and Student Participation In On-site Experiences for Group A: First Semester

Activity	Did Participate	Did Not Participate
Took Attendance	18	1
Gave remedial help to students	10	9
Worked with cumulative records	11	8
Made a case study of a pupil	10	9
Had parent conferences	3	16
Discussed student with counselor	11	8
Discussed pupils with teacher	19	0
Worked with slow learners	18	1
Visited homes of students	1	18
Attended community functions	4	15
Planned bulletin board	9	10
Kept grade books	15	4
Prepared stencils	12	7
Developed supplementary materials	9	10
Located supplementary materials	15	4
Used audio-visual equipment	10	9
Set up demonstrations	10	9
Made assignments	10	9
Gave drills and reviews	10	9
Constructed and gave exams	11	8
Discussed tests with students	10	9
Made class presentations	16	3
Led class discussions	12	7
Supervised classroom study	15	4
Helped with discipline problems	10	9
Helped plan a field trip	4	15
Held conferences with students	7	12
Assisted with extra activities	7	12
Attended faculty meetings	4	15
Became familiar with:		
Principal's office	5	14
Guidance office	12	7
Library	14	5
Materials center	12	7

D. Jacobsen, "An Assessment of the Effects of Two Experimental Arrangements on the Verbal Behavior of Student Teachers" (unpublished Doctor's dissertation, Arizona State University, 1970).

instructional activities for Group B and were compiled by Professor James Bell. Each class session was monitored and critiqued by the Professor and all alterations and changes in the original instructional planning were noted and appear as changed in Appendix B.

These class activities began with a discussion of "What is teaching." Videotapes of teachers in action were utilized as well as summaries of the work of Taba, Bellack, Smith, and others to enhance the initial activity. At the conclusion of this opening discussion, students planned and executed a microteach unit in their own subject matter area.

Flander's Interaction Analysis System was presented to Group B during four class meetings of the first semester. The first meeting involved an over-all introduction to interaction analysis, observation procedures, and category descriptions. Students were supplied with materials which discussed interaction analysis and ground rules for its use and implementation according to the Flander's philosophy. Following sessions were devoted to practice coding and matrix interpretation in addition to student oriented microteaching lessons related to and incorporating the Flander's System of Interaction Analysis as a feedback tool for instructional improvement.

Seven weeks of the semester activities for Group B involved methods for improving student-teacher interaction in the classroom. During this part of the treatment, emphasis was placed upon instruction in the use of questioning strategies, i.e., redirection, calling on

volunteers and non-volunteers, the elimination of negative behaviors, the use of prompting techniques, and methods of framing comprehensive, analytical, and evaluative questions. Students planned and engaged in microteach activities pertaining to each of these areas of instruction and use of strategies and emphasis was placed on re-teach sessions if deemed necessary by critiquing students and professors.

The remainder of the activities for the first semester included instruction in behaviorally stating instructional objectives, set induction theory, group dynamics instruction and training, effective utilization of audio-visual materials, and the preparation of a unit of instruction. Students planned and presented a twenty-minute lesson from the unit which was videotaped and critiqued by instructors and students. The final activity for Group B during the first semester of the Pilot Project involved a written evaluation of the course activities and preparation for the following semester of the project.

The program for the second semester of the Pilot Project for Group A was basically a continuation of the first semester's activities. Changes included an increase of participation in activities for most students, as shown by comparing the data in Table 2 and Table 3, and an increased number of seminars. However, the program for Group B's second semester activities was markedly different from the first semester in that Group B paralleled the activities of Group A by going into the field for on-site observation and participation activities which were correlated with seminars

Table 2

Variety of Activities and Student Participation in On-site Experiences for Group A: Second Semester

Activity	Did Participate	Did Not Participate
CLASSROOM MANAGEMENT		
1. Took attendance	19	0
2. Recorded grades	18	1
3. Helped with discipline problems	17	2
DEVELOPMENTAL ACTIVITIES		
1. Set instructional objectives	18	1
2. Selected subject matter	18	1
3. Planned for instruction	18	1
4. Developed supplementary materials	19	0
5. Located supplementary materials	19	0
CLASSROOM ACTIVITIES		
1. Tutorial situations	18	1
2. Maintained student relationships	19	0
3. Used inquiry methods of instruction	18	1
4. Used audio-visual aids	17	2
5. Gave remedial help to students	16	3
6. Worked with slow learners	17	2
7. Supervised classroom study	19	0
8. Conducted demonstrations	19	0
9. Made assignments	19	0
10. Gave drills and reviews	17	2
11. Led discussion	17	2
12. Made presentations	19	0
DIAGNOSIS, EVALUATION, AND REPORTING		
1. Developed evaluation activities	17	2
2. Worked with cumulative records	18	1
3. Conducted parent conferences	9	10
4. Held pupil conferences	14	5
5. Graded examinations	17	2

D. Jacobsen, "An Assessment of the Effects of Two Experimental Arrangements on the Verbal Behavior of Student Teachers" (unpublished Doctor's dissertation, Arizona State University, 1970).

Table 3

Variety of Activities and Student Participation in On-site Experiences for Group B: Second Semester

Activity	Did Participate	Did Not Participate
CLASSROOM MANAGEMENT		
1. Took attendance	17	3
2. Recorded grades	15	5
3. Helped with discipline problems	12	8
DEVELOPMENTAL ACTIVITIES		
1. Set instructional objectives	16	4
2. Selected subject matter	15	5
3. Planned for instruction	17	3
4. Developed supplementary materials	17	3
5. Located supplementary materials	17	3
CLASSROOM ACTIVITIES		
1. Tutorial situations	15	5
2. Maintained student relationships	19	1
3. Used inquiry methods of instruction	16	4
4. Used audio-visual aids	13	7
5. Gave remedial help to learners	12	8
6. Worked with slow learners	11	9
7. Supervised classroom study	13	7
8. Conducted demonstrations	9	11
9. Made assignments	11	9
10. Gave drills and reviews	12	8
11. Led discussions	17	3
12. Made presentations	17	3
DIAGNOSIS, EVALUATION, AND REPORTING		
1. Developed evaluation activities	12	8
2. Worked with cumulative records	6	14
3. Conducted parent conferences	3	17
4. Held pupil conferences	7	13
5. Graded examinations	19	1

D. Jacobsen, "An Assessment of the Effects of Two Experimental Arrangements on the Verbal Behavior of Student Teachers" (unpublished Doctor's dissertation, Arizona State University, 1970).

and readings. The data in Table 2 indicates the variety of student participation in classroom experiences for Group A during the second semester of the Pilot Project and the data in Table 3 reveals the same information for Group B.

The seminars, as was the case during the first semester, were designed to parallel the activities the students experienced in the field and were offered in joint sessions which involved both Group A and Group B. Topics for discussion included:

1. How do people learn?
2. How do teachers teach?
3. Motivation
4. Developing behaviorally stated objectives
5. Selecting appropriate content
6. Evaluation, grading and reporting
7. Problems of student teaching
8. Job placement
9. Problems of observation and participation activities

Outside readings were assigned to provide a foundation for the topics discussed in the seminars throughout the semester. Students of both groups spent a minimum of nine hours per week in cooperating schools and received seven hours of academic credit for successful completion of the second semester of the experimental Pilot Project.

During the semester break between second and third semester of the Pilot Project, Group A received instruction in the Flander's System of Interaction Analysis. The Flander's System was presented

to the student in the same way in which it was presented to Group B during the first semester of the project. The students of Group A had the opportunity to code, interpret a matrix, and establish a pattern in a microteach situation.

The third and final semester of the Pilot Project for both Group A and Group B consisted of a closely supervised field experience commonly referred to as student teaching or internship. Progress was periodically evaluated by professors from the Department of Secondary Education at Arizona State University as well as college supervisors from other departments representing the academic disciplines in which the students in the Pilot Project were majoring, directing teachers and local school administrators were also involved in the evaluation process. In-depth continuation of topics previously discussed in seminar meetings were continued on a regularly scheduled basis throughout the semester, i.e., weekly. In addition to the field experiences and seminars, a review of the Flander's System of Interaction Analysis was presented to both groups in joint sessions. The instruction involved coding and matrix interpretation. Students of both groups received eight hours of academic credit for the successful completion of the third and final semester of the program.

Table 4 illustrates the over-all sequence of treatment Group A and treatment Group B for the three semester duration of the experimental Pilot Project in Secondary Education at Arizona State University.

Table 4

Over-all Schematic for Treatment Groups in Pilot Project

Experimental Group	Semester I Junior Year Spring 1969	Semester II Junior or Senior Year Fall 1969-70	Semester III Senior Year Spring 1970
Group A 19 Students	On-site experiences in the public schools Emphasis: Observation and participation Seminars, readings, case studies and other individualized study Minimum of 9 classroom hours for 7 hours of academic credit	Continue with on-site experiences Emphasis: Participation and observation 9 hours minimum classroom contact hours for 7 hours of academic credit	Student teaching or internship 8 hours of academic credit
Group B 20 Students	A.S.U. Campus Classroom experiences Emphasis: CCTV, Simulation, microteaching case studies and related readings Minimum of 7 classroom hours for 7 hours of credit	On-site experiences in the public schools Emphasis: Observation and participation Minimum of 9 classroom hours for 7 hours of credit	Student teaching or internship 8 hours of academic credit

IV. SOURCE OF DATA

During the final semester of the experimental study all students in both groups were posttested with the observation scales of the IOTA. The 14 observation scales of IOTA were designed primarily to measure the effectiveness of the role of the teacher as director of learning activities in the classroom. The teacher as director of learning has been established as area one of six areas of teacher competence set forth in The Role of the Teacher in Society: Six Areas of Teacher Competence published by the National IOTA Council. The observation scales of the IOTA correspond directly with the roles identified as characteristic of competent professional teachers which appear in Appendix A under the heading of Guide to Learning Experiences. These roles were adapted from the IOTA statement and have direct relationship to the IOTA instrument. See Appendix C for a copy of the observation scales.

Within a period of two weeks, commencing on April 13, 1970, each student was observed twice by a trained observer. The inter-observer reliability was established for all four members of the observation team who were involved in the data gathering process. The observers used to gather posttest data for the study were all trained by qualified IOTA consultants representing the National IOTA Council. A minimum of 80 hours of workshop training in the use of the instrument was used as a prerequisite to selecting the observers. Availability of observers with this amount of experience was also considered in the selection process.

Two data gathering sessions were used as pilot tests to establish interobserver reliability in the use of the observation scales of IOTA. The first session was arranged in conjunction with a National IOTA Council Leadership Training Program conducted on the Arizona State University Campus in April 1970.

A live classroom observation was made in the Mesa Public Schools, see Appendix D. The duration of the observation was 45 minutes and the results of this observation in terms of interobserver reliability can be found in Table 5.

A second pilot test observation was conducted in the micro-teaching laboratory of the Secondary Education Department at Arizona State University at which time a 45-minute videotape of a high school biology lesson was viewed and coded simultaneously by the four observers. The results of this session in terms of interobserver reliability is found in Table 6.

A high degree of agreement was found in both sessions and the reliability of the four observers was well within the range of acceptability. All of the observations were reported and scored before reconciliation for correction. The lowest degree of agreement on either pilot test observation was .83 between observer 1 and observer 4. The highest degree of agreement was found between observers 1 and 3, 1 and 2, and 1 and 4 which was .96.

A reliability correlation of .87 is considered a satisfactory level by the authors of the instrument.

Table 5

Reliability for Four Observers on a 45 Minute Sixth Grade Math Class Observation Made in the Mesa Public Schools

Observer	1	2	3	4
1	1.00	.96	.92	.94
2		1.00	.92	.90
3			1.00	.91
4				1.00

This obscrvation was made under the auspices of the National IOTA Council Leadership Training Conference held at Arizona State University.

Table 6

Reliability for Four Observers on a 45 Minute Videotaped Biology Lesson

Observer	1	2	3	4
1	1.00	.87	.96	.96
2		1.00	.87	.83
3			1.00	.92
4				1.00

V. INSTRUMENT

The Instrument for the Observation of Teaching Activities was first developed as an evaluative instrument to compare the competence of experimental groups in teacher education programs with those of regular or traditional programs.[1]

Techniques of Construction

The instrument was first developed in 1958 as a part of a project to appraise an experimental teacher education program at the University of Hawaii.[2] The criterion selected by the appraisal committee was the California Definition published by the California Teachers Association.[3] In this definition there were 100 statements of what is to be expected and achieved by the competent teacher. These statements comprise the framework of the definition. See Appendix A for the revised statements used in this study.

In the initial development and later revisions of the scales, these statements were prepared as a list and circulated among the faculty in the University of Hawaii College of Education with a request to view:

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[1]The Committee on IOTA, Measuring Teacher Competence: Research Backgrounds and Current Practices (Burlingame: The California Teachers Association, 1967).

[2]Lucien Kinney, et. al., "A Criterion of Appraisal of Student Teaching," Evaluating Student Teaching, Thirty-Ninth Yearbook of the Association for Student Teaching (Dubuque: William Brown Co., 1960), pp. 46-56.

[3]California Teachers Association, Commission on Teacher Education, Teacher Competence: Its Nature and Scope (San Francisco: The Association, 1957), pp. 31-42.

> Comprehensiveness. Are there any serious omissions in areas of competence? If so, indicate by additions.
> Selectivity. Are any statements irrelevant or unimportant? If so, indicate by deleting them.
> Priority of Importance. Indicate what you consider to be the thirty most important items, by numbering them from 1 to 30, with 1 indicating the most important in your judgment.[4]

On the basis of these faculty judgments, 25 statements were selected as the categories to use in building the scales.

The scale format was a five item, forced choice design. The statement, usually in more concise form, was retained as the heading for the scale. Five items, describing behavior at levels from mediocre to professionally most desirable were listed to form the scale under each heading. In the final form the scale under each heading was in random order, to force a choice by the observer in terms of content rather than position. The tendency for good and bad impressions in one area to influence other areas of a rating scale has long been recognized. There is some basis for belief, subject to further study, that it is useful to shuffle the order of items which define the dimensions on a factor being rated, thus helping to avoid the halo effect. This practice was used in the IOTA. To assure that each item was concise, unambiguous and a specific description of observable behavior, the scales were distributed to the faculty with a request to: (1) edit any item that does not appear to be concise and specific, (2) where possible substitute

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[4]Lucien Kinney and Warren Kallenbach, "The Quality of Measurements Obtained Through the Use of IOTA" (mimeographed, San Jose State College, 1969).

a more suitable description of behavior at a given level, and (3) indicate, by numbering from 1 to 5, the level of competence each item indicates, in ascending order.[5] The items were then revised in accord with the critique of the faculty.

Next, the instrument was tried out in practice by two former supervisors of student teachers, who were also to serve as observers when the instrument was used for experimental purposes. Not only were the scales tested for effectiveness in directing observation, but observation and scoring forms were developed to make the observations as consistent and economical as possible. These observations were carried out jointly by the two observers but the scoring of the observation data was conducted independently. After scoring the results were compared. Only when 90 percent of the items were judged identically by the two observers were scales and procedures adequate for evaluation of the experimental and control groups.[6]

In the Hawaiian study 70 members of the experimental program were paired with 70 who had graduated from the regular program in the same year, with each pair selected to be within the same building. Each teacher was visited twice for one half day by each observer, each observing at different times. The results of the study showed that the graduates of the regular program were somewhat more competent

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[5] Ibid., p. 3.

[6] Ibid.

than those from the experimental program and, that the instrument and procedures provided an evaluative research technique of acceptable quality.[7]

Correlations between ratings of the two observers were .87 which approximates the correlation commonly obtained by repetition of a well designed test of arithmetic computation skills. The mean rating of the experimental group was 4.0 on the five point scale, and the mean rating of the regular group was 4.4.[8]

The quality of measurements obtained from the use of the scales was sufficiently high to attract the attention of those who needed to evaluate the results of similar projects in San Francisco. The same procedures for constructing and using the scales were followed, with good results.[9] Members of the staff at San Jose State College were also attracted by the efficiency of the instrument and procedures, and undertook to revise the scales and procedures to improve their quality and economy. The instrument was to evaluate teacher competence in the program for preparing elementary teachers

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[7]Ibid., p. 4.

[8]Ibid.

[9]The Division of Education, Los Angeles State College, A Follow-up Study of a Group of Graduates from the Elementary Education Program (unpublished manuscript, Los Angeles State College, Division of Education, 1960).

as well as in the elementary schools in the neighboring districts.[10]

Members of the San Jose faculty organized the Committee on IOTA, and in order to carry out a systematic revision of the instrument and maintain proper utilization of the instrument as well as fostering research using the technique of direct observation attained a copyright for the instrument.

Quality of the Instrument

Several characteristics need to be taken into account when the quality of measurements obtained from a procedure or instrument is to be determined. The three most important are:

Validity. The instrument or procedure should actually measure what it purports to measure.

Reliability. The measurements should be consistent upon repeated application or when comparisons are made between two observers making simultaneous measurements.

Discriminative ability. The measurements should be sufficiently refined to identify differences sufficiently small to fulfill the purposes of the measurements.

Validity

Criterion referenced measurements are validated primarily in terms of the adequacy with which they represent the criterion.

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[10]Warren Kallenbach and Viola Owen, "Measuring Teacher Effectiveness: A Training Program for California Administrators," California Elementary Administrator, 43:32-37, March, 1962.

Therefore, content validity approaches are more suited to such tests. A carefully made judgment, based on the test's apparent relevance to the behaviors legitamately inferable from those delimited by the criterion, is the general procedure for validating criterion referenced measures.[11]

The item construction of a criterion-referenced measurement instrument is designed to provide an accurate reflection of the criterion behavior. Difficult or easy, discriminating or indiscriminate, the important thing is to make the item represent the class of behaviors delimited by the criterion.[12]

The construction of the scales for the IOTA was so designed as to assure that validity was inherent in the scales. The nature of the criterion was such that the development of the scales was, essentially, a development of the definition.[13] Thus, the scales were derived from the criterion, which is held as the ideal procedure by authoritative groups in measurement.[14]

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[11] W. James Popham and T. R. Husek, "Implications of Criterion Referenced Measurement," Journal of Educational Measurement, 6,1:6, Spring, 1969.

[12] Ibid., p. 4.

[13] The Commission on Teacher Education, loc. cit.

[14] American Education Research Association, "Report on the Committee on the Criteria of Teacher Effectiveness," Review of Educational Research, 22:238-61, June, 1952; see also Journal of Educational Research, 46:641-58, May, 1953; American Psychological Association, Technical Recommendations for Tests and Diagnostic Techniques (Washington, D. C.: The Association, 1954), pp. 13-28.

It should be recognized that the scales can be only a sampling of the competencies outlined in the criterion. This same limitation exists in any extensive evaluation project. The crucial condition is that the sample should also include the competencies that are most in need of evaluation, those that are considered most important in light of local philosophy and needs. The extensive utilization of faculty judgment in selection of statements to be developed into scales, as well as editing the items in the scales, assures local as well as general validity.

Evidence of concurrent validity for IOTA is available in the Hawaii project. It was found that the correlation between the principal's judgments and ratings on IOTA were .76. In the San Francisco project, the evaluators were required to make an independent judgment of the over-all competence of the intern teachers in addition to using IOTA. The correlation between the independent and IOTA judgment was .93. At Los Angeles State College, in 1959, an exploratory appraisal was made of a randomly drawn sample (N=49) from 270 teachers who were recent graduates of the college. The correlation between ratings of observers using IOTA and principal's ratings was .75. The correlation between observers' over-all ratings without the scales and their ratings on the scales was .72.[15]

Rather than measures of validity, these correlations are better interpreted as the measure of commonality of criteria among

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[15]The Division of Education, loc. cit.

the observers or between observers and principals. To the degree that the criteria become increasingly identical, the correlations will be improved. Evidence for this point of view is found in a study at the University of California at Berkeley which tested levels of agreement among trained observers using a form of IOTA. This study focused on the factor of training in the use of the instrument. Untrained observers arrived at no significant level of agreement on teacher competence after using the instrument on three filmed sessions of classroom teaching.[16] In a second study at the same institution, two observers who had been trained in the use of the instrument, judged the teaching ability of 70 teachers participating in the university student teaching program. Here the correlation between ratings of the two observers was .93.[17]

A recent doctoral dissertation at Arizona State University found significant, positive correlations between participation in an IOTA Observer Training Workshop for teachers and their use of indirect interaction patterns as measured by the Flander's System

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[16] Eva Washington, "An Examination of the Perceptions of Educators While Evaluating Student Teachers" (unpublished Doctor's dissertation, University of California at Berkeley, School of Education, 1962).

[17] John Jones, "Comparisons Between Most and Least Effective Cooperating Teachers" (unpublished Doctor's dissertation, University of California at Berkeley, School of Education, 1964).

of Interaction Analysis and high child-centered attitudes as recorded on the Minnesota Teacher Attitude Inventory.[18]

Reliability

The evidence appears to support a contention of a relatively high level of reliability for measurements through the use of IOTA. It will be recalled that interobserver reliability coefficients in the original Hawaii study were .87 and in the Berkeley study .93. Data from other studies are also available.

At San Jose State College in 1959, 38 elementary student teachers were judged by trained college observers, 27 of the group being rated twice. Observations were usually for a 45 minute class period. Preparations for observations are described in the published account of the study. The interobserver reliability for the 27 student teachers rated twice was .86.[19]

A third dissertation at Berkeley was designed to test Carl Rogers' hypothesis that his Helping Relationship concept is significantly correlated with teacher competence. Eighteen teachers at the seventh and eighth grade levels were observed as were their interactions with 452 students. No significant relationships were found between administration of two criterion instruments, the

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[18]Larry Stevens, "An Experiment to Determine the Effects of an IOTA In-service Training Program Upon Teacher-Pupil Verbal Interaction" (unpublished Doctor's dissertation, Arizona State University, 1969).

[19]Lucien Kinney, et. al., loc. cit.

Relationship Inventory and IOTA. This was interpreted as a rejection of the Rogers' hypothesis. The interobserver reliability in the use of the IOTA was found to be .97, however.[20]

Another study at San Jose State College (1961-1967) was undertaken to refine and revise the instrument and carry out research on its characteristics. Evaluator training programs were conducted on the college campus during summer sessions and the instrument was used in programs for the improvement of instruction in school districts in the area. IOTA became the official evaluation instrument in the San Jose State Elementary Intern Teaching Program.[21]

During the spring semester from 1962 to 1965, two trained observers used IOTA for at least one major assessment of teaching competence each year. The interobserver reliability figures for each year are shown in Table 7.

The small number of subjects during each assessment requires caution in drawing inferences from the data. However, the coefficients are consistent with other reliability studies in that larger r's are from the larger groups and that the highest reliability is in the largest group observed.[22]

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[20]Jack Thompson, "The Relationship Between Carl Rogers' Helping Relationship Concept and Teacher Behavior" (unpublished Doctor's dissertation, University of California at Berkeley, School of Education, 1964).

[21]Warren Kallenbach and Viola Owen, loc. cit.

[22]Robert Ramonda and Warren Kallenbach, "Evaluations of San Jose State College Elementary Intern Teachers, 1962-65" (unpublished manuscript, San Jose State College, School of Education, 1965).

Table 7

IOTA Interobserver Reliabilities, 1962 to 1965, San Jose State College Elementary Intern Teaching Program

Year	N	r
1962	10	.68
1963	12	.86
1964	10	.75
1965	20	.95

IOTA was also used as one of the criterion in a USOE-sponsored study of the effectiveness of a summer microteaching program in the preparation of elementary intern teachers on the San Jose College campus in the summer of 1967. In testing the reliability of IOTA, two trained observers judged independently the competence of a sample of 12 teachers. The coefficient of correlation between ratings was .80.[23]

In summary, it seems evident that the reliability of the instrument is sufficient for use in an experimental situation. It also seems evident that training of observers is essential to secure this reliability. The implications for the latter condition is discussed in Appendix E.

Discriminative Ability

Attention is given to the discriminative ability of IOTA only when it is used in an experimental situation to compare groups, although it is equally important in other situations. Unless a scale is very carefully constructed only the middle section will be used. The tendency for good or bad impressions in one area to influence other areas of a rating scale has long been recognized. In an attempt to avoid mutual influence among items of the IOTA scales, each scale description has been stated in behavioral terms which were carefully defined. An extra attempt to remove the halo

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[23]Warren Kallenbach and Robert Ramonda, The Effectiveness of Microteaching in the Preparation of Elementary Inter Teachers: Final Report, Office of Education Project No. 6-1303 (Washington, D. C.: Department of Health Education and Welfare, 1967).

effect from the instrument was attained by shuffling the order of the items which define the dimensions of a factor being rated.

Each rating in the scale was directed to one variable. In this study the reporting aspect of the rating was sharply differentiated from the interpretation aspect. Each observer was expected to focus his attention on reporting what he saw. The judgmental aspect of the rating was postponed and done as a separate operation. When used in Hawaii, the instrument was adequate to identify significant difference. In San Francisco, the discriminative ability of the instrument was checked by preparation of a table showing frequency of use of each item on each scale.[24]

VI. EXPERIMENTAL DESIGN

A simple-randomized design using a posttest only format was used for this study. Randomization was attained by assigning a volunteer population to two independent treatment groups. This practice is supported by Edwards in his statement that, "A random sample is one obtained by a particular method that is believed to produce randomness in the selection of participants for a treatment group."[25]

In this study the participants were randomly assigned to treatment groups by a selection process using a hat as a sample box

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[24]The San Francisco Unified School District Board of Education, The San Francisco Teacher Recruitment and Training Program (San Francisco: The Board, 1960), p. 88.

[25]Allen Edwards, Experimental Design in Psychological Research (New York: Holt, Reinhart, and Winston, Inc., 1968), p. 19.

in which the names of participants were thoroughly mixed before each name was selected. Thus, each treatment is independently administered to a different sample of subjects.

According to Hays this method of random assignment is referred to as selection without replacement, which means that each event can occur no more than once in a given sample. Hays further stated that in this type of random sampling the composition of space changes with each trial since a name can be selected only once in a given sample. However, it can be assumed that by following the sampling procedure used in this study that among the elementary events available for selection on a given trial, the probabilities are equal.[26] In the selection without replacement procedure used to arrive at a random sample in this study, N different subjects are chosen to represent a treatment group and each is not replaced before the next is sampled. This procedure does not violate the notion of simple random sampling. Instead of requiring that each elementary event be equally likely to occur on each trial, it is required that all samples of N possible outcomes be equally likely to occur.[27] After administration and assignment of subjects to treatment groups each may then be regarded as a simple random sample. Lindquist stated that once the experimental subjects are randomized with reference to treatment groups, it can be fairly contended that experimental groups are random

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[26]William Hays, Statistics (New York: Holt Reinhart and Winston, Inc., 1963), p. 64.

[27]Ibid., p. 67.

samples drawn from the same hypothetical parent population.[28]

The posttest only position used in this study is supported by Campbell and Stanley as follows:

> The most adequate all-purpose assurance of initial biases between groups is randomization. Within the limits of confidence stated by the tests of significance, randomization can suffice without the pretest.[29]

The experimental design applicable to this study stated symbolically is:

R X_1 0

R X_2 0

The X_1 represents the experimental Group A and X_2 represents experimental Group B. In both cases the 0 represents posttest observation using the 14 observation scales of IOTA and the R represents random assignment to treatment groups.

Campbell and Stanley indicate the strength of this random group design as controlling all threats to internal validity as well as the external validity threat of Interaction of Testing and X. Interaction and Selection of X as a threat to external validity will be controlled by conducting the study in a state university which has similar characteristics of other teacher training institutions. This procedure minimizes the concern about the main effect of the school itself.[30]

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[29]Donald Campbell and Julian Stanley, "Experimental and Quasi-experimental Designs for Research on Teaching," Handbook of Research on Teaching (Chicago: Rand McNally and Co., 1963), p. 195.

[30]Ibid., p. 189.

VII. STATISTICAL TREATMENT OF THE DATA

The purpose of this investigation was to determine the effects of two experimental arrangements of pre-service secondary teachers on the classroom behaviors of participant trainees. All data collected were designed to reveal behavioral characteristics overtly displayed in the classroom situation.

The criterion-referenced measure used in this study, IOTA, was used to ascertain a group's status with respect to a performance standard established by the instrument and accepted by the Pilot Project. It is because the groups were compared with an established criterion, rather than other individuals that these measures are described as criterion-referenced. The meaningfulness of an individual's score is not dependent on comparisons with other students being measured. Criterion-referenced measures have been devised to make decisions about individuals and treatments, e.g., instructional programs. In case of decisions regarding individuals, a criterion-referenced measurement could be used to determine whether the learner had mastered a criterion skill considered prerequisite to his commencing a new training program. In the case of decisions regarding treatments, one can use a criterion-referenced measurement like IOTA which reflects program objectives to be achieved by a replicable instructional sequence. Administration of IOTA to appropriate learners after they had completed an instructional sequence presented data regarding the efficacy of the sequence (treatment).

The use of traditional descriptive statistics such as means and standard deviations is advisable in evaluating treatments when the desired outcome is the average level of performance produced by the individuals in a treatment.[31]

Posttest data collected from IOTA was analyzed to determine whether the mean behaviors of Group A and Group B were significantly different with respect to the 14 observation scales of the instrument. For each IOTA scale analyzed in this investigation, the score represented the mean of the two 45 minute observations made during the final semester of the experimental Pilot Project.

Each null hypothesis corresponding to the observation scales of IOTA was analyzed with a t test to determine the level of significant difference between the mean behaviors of the two experimental groups. Whenever only two groups are being compared for differences between uncorrelated means in two samples "t" is appropriate for the test of significance between the groups.[32] Campbell and Stanley discussed the t statistic as an optimal test to use with the posttest only design using two groups.[33]

Assumptions underlying the use of the t test were met by randomization of the experimental population and the interpretation

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[31] Popham and Husek, op. cit., p. 8.

[32] J. Wert, C. Neidt, and J. Ahmann, Statistical Methods in Education and Psychological Research (New York: Appleton-Century-Crofts, Inc., 1954), p. 172.

[33] Ibid., p. 195.

of normal distribution which applies to the statistic t regardless of the size of the sample.[34] Differences in mean scores were judged significant at the .05 confidence level. Wert, Neidt, and Ahmann[35] state that the .05 level of confidence is assumed to be a significant departure from differences that might occur by chance alone.

A pooled variance formula was used to compute the t ratios to compensate for the unequal groups, Group A, 19, and Group B, 20.

VIII. ORGANIZATION OF REMAINDER OF STUDY

Activities and procedures, sources of data, instrument construction and validation, experimental design, and statistical treatment of the data were discussed in Chapter III. The following chapters, IV and V, contain the analysis of the data, Chapter IV, and the summary, conclusions and recommendations, Chapter V.

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[34] J. P. Guilford, Fundamental Statistics in Psychology and Education (New York: McGraw-Hill Book Company, 1956), p. 182.

[35] Wert, Neidt, and Ahmann, op. cit., p. 174.

CHAPTER IV

FINDINGS

Students involved in two experimental arrangements of a pre-service secondary teacher education sequence were observed. Their teaching activities were assessed to determine differences between the two groups when measured by the criterion of the 14 observation scales of IOTA.

The scale rating assigned to each category was given a numerical score from 1 to 5, with the largest score representing the most desirable behavior. A mean score for each individual for each scale was derived from two 45 minute observations of the classroom teaching activities of each participant. Grand means were then computed by combining the means of all of the students in each group for each of the 14 observation scales.

As pointed out in Chapter III, a posttest only design was used in this study. The analysis of the data was performed by the use of the t statistic using a pooled variance formula to compensate for the unequal groups.

I. REVIEW OF THE NULL HYPOTHESES

The null hypotheses which were tested in this research were presented in Chapter I. They are reviewed here as an aid

in interpreting the results and in relating these results to the earlier theoretical presentation. The following hypotheses were tested:

Hypothesis 1--There is no significant different between the mean behaviors of Group A and Group B as measured by Scale 1 (Interest Centers) of IOTA.

Hypothesis 2--There is no significant difference between the mean behaviors of Group A and Group B as measured by Scale 2 (Variety in Activities) of IOTA.

Hypothesis 3--There is no significant difference between the mean behaviors of Group A and Group B as measured by Scale 3 (Use of Materials for Instruction) of IOTA.

Hypothesis 4--There is no significant difference between the mean behaviors of Group A and Group B as measured by Scale 4 (Classroom Control) of IOTA.

Hypothesis 5--There is no significant difference between the mean behaviors of Group A and Group B as measured by Scale 5 (Learning Difficulties) of IOTA.

Hypothesis 6--There is no significant difference between the mean behaviors of Group A and Group B as measured by Scale 6 (Individualization of Instruction) of IOTA.

Hypothesis 7--There is no significant difference between the mean behaviors of Group A and Group B as measured by Scale 7 (Development and Implementation of Classroom Goals) of IOTA

Hypothesis 8--There is no significant difference between the mean behaviors of Group A and Group B as measured by Scale 8 (Opportunity for Participation) of IOTA.

Hypothesis 9--There is no significant difference between the mean behaviors of Group A and Group B as measured by Scale 9 (Exploration of Value Judgments) of IOTA.

Hypothesis 10--There is no significant difference between the mean behaviors of Group A and Group B as measured by Scale 10 (Creative Expression) of IOTA.

Hypothesis 11--There is no significant difference between the mean behaviors of Group A and Group B as measured by Scale 11 (Development of Student Initiative) of IOTA.

Hypothesis 12--There is no significant difference between the mean behaviors of Group A and Group B as measured by Scale 12 (Social Climate) of IOTA.

Hypothesis 13--There is no significant difference between the mean behaviors of Group A and Group B as measured by Scale 13 (Subject Matter Preparation) of IOTA.

Hypothesis 14--There is no significant difference between the mean behaviors of Group A and Group B as measured by Scale 14 (Current Application of Subject Matter) of IOTA.

II. ANALYSIS OF THE DATA

According to the null hypotheses there is no significant difference between the two groups of students being compared when IOTA was utilized as the measurement device. The t ratio determined

by means of a pooled variance formula was used as the analysis test. The .05 level of confidence was established before data were gathered.

In this study, t ratios were computed using the following set of measures:

1. Two experimental groups of pre-service secondary teacher trainees were compared using the results of two 45 minute classroom observations of their teaching activities.

2. Comparisons were made of each of the 14 observation scales of the criterion measure for each group.

3. The scores from all participating trainees were summed and a grand mean score for each observation scale was computed.

4. The grand mean score for each observation scale for each group was then submitted to a t test.

Hypothesis 1

According to the null hypothesis there is no significant difference between the performance of students in Group A and students in Group B in the use of interest centers.

The data in Table 8 exhibits a mean score for Group A of 3.23 and a mean score for Group B of 3.45. An analysis of these mean scores using the appropriate degrees of freedom yielded a t ratio of .978 which was not significant at the .05 level of confidence.

Table 8

A Comparison of Scale 1 (Interest Centers) For Experimental Groups A and B

Group	Number	Standard Deviation	Mean	t
A	19	.848	3.23	.978
B	20	.415	3.45	

Hypothesis 2

According to the null hypothesis there is no significant difference between the performance of students in Group A and students in Group B in the variety of activities exhibited in the classroom.

The data in Table 9 exhibits a mean score for Group A of 3.23 and a mean score for Group B of 3.00. An analysis of these mean scores using the appropriate degrees of freedom yielded a t ratio of .855 which was not significant at the .05 level of confidence.

Table 9

A Comparison of Scale 2 (Variety in Activities)
For Experimental Groups A and B

Group	Number	Standard Deviation	Mean	t
A	19	.848	3.23	.855
B	20	.836	3.00	

Hypothesis 3

According to the null hypothesis there is no significant difference between the performance of the students in Group A and the students in Group B in the use of materials for instruction.

The data in Table 10 exhibits a mean score for Group A of 3.10 and a mean score for Group B of 3.30. An analysis of these mean scores using the appropriate degrees of freedom yielded a t ratio of .755 which was not significant at the .05 level of confidence.

Table 10

A Comparison of Scale 3 (Use of Material for Instruction) For Experimental Groups A and B

Group	Number	Standard Deviation	Mean	t
A	19	.882	3.10	.755
B	20	.678	3.30	

Hypothesis 4

According to the null hypothesis there is no significant difference between the performance of students in Group A and students in Group B in the area of classroom control.

The data in Table 11 exhibits a mean score for Group A of 3.76 and a mean score for Group B of 3.77. An analysis of these mean scores using the appropriate degrees of freedom yielded a t ratio of .044 which was not significant at the .05 level of confidence.

Table 11

A Comparison of Scale 4 (Classroom Control) For Experimental Groups A and B

Group	Number	Standard Deviation	Mean	t
A	19	.864	3.76	.044
B	20	.782	3.77	

Hypothesis 5

According to the null hypothesis there is no significant difference between the performance of students in Group A and students in Group B in dealing with learning difficulties in the classroom.

The data in Table 12 exhibits a mean score for Group A of 3.73 and a mean score for Group B of 3.80. An analysis of these mean scores using the appropriate degrees of freedom yielded a t ratio of .205 which was not significant at the .05 level of confidence.

Table 12

A Comparison of Scale 5 (Learning Difficulties) For Experimental Groups A and B

Group	Number	Standard Deviation	Mean	t
A	19	.991	3.73	.205
B	20	.886	3.80	

Hypothesis 6

According to the null hypothesis there is no significant difference between the performance of students in Group A and the students in Group B in individualizing instruction.

The data in Table 13 exhibits a mean score for Group A of 2.18 and a mean score for Group B of 2.42. An analysis of these mean scores using the appropriate degrees of freedom yielded a t ratio of .602 which was not significant at the .05 level of confidence.

Table 13

A Comparison of Scale 6 (Individualization of Instruction) For Experimental Groups A and B

Group	Number	Standard Deviation	Mean	t
A	19	1.183	2.18	.602
B	20	1.247	2.42	

Hypothesis 7

According to the null hypothesis there is no significant differences between the performance of students in Group A and students in Group B in the development and implementation of classroom goals.

The data in Table 14 exhibits a mean score for Group A of 2.39 and a mean score for Group B of 2.42. An analysis of the mean scores using the appropriate degrees of freedom yielded a t ratio of .092 which was not significant at the .05 level of confidence.

Table 14

A Comparison of Scale 7 (Development and Implementation of Classroom Goals) For Experimental Groups A and B

Group	Number	Standard Deviation	Mean	t
A	19	.953	2.39	.092
B	20	1.040	2.42	

Hypothesis 8

According to the null hypothesis there is no significant difference between the performance of students in Group A and students in Group B in providing opportunity for participation.

The data in Table 15 exhibits a mean score for Group A of 3.81 and a mean score for Group B of 3.72. An analysis of the mean scores using the appropriate degrees of freedom yielded a t ratio of .361 which was not significant at the .05 level of confidence.

Table 15

A Comparison of Scale 8 (Opportunity for Participation) For Experimental Groups A and B

Group	Number	Standard Deviation	Mean	t
A	19	.861	3.81	.361
B	20	.660	3.72	

Hypothesis 9

According to the null hypothesis there is no significant difference between the performance of students in Group A and students in Group B in the area of exploration of value judgments.

The data in Table 16 exhibits a mean score for Group A of 2.34 and a mean score for Group B of 2.18. An analysis of the mean scores using the appropriate degrees of freedom yielded a t ratio of .370 which was not significant at the .05 level of confidence.

Table 16

A Comparison of Scale 9 (Exploration of Value Judgments) For Experimental Groups A and B

Group	Number	Standard Deviation	Mean	t
A	19	1.39	2.34	.370
B	20	1.49	2.18	

Hypothesis 10

According to the null hypothesis there is no significant difference between the performance of students in Group A and students in Group B in eliciting creative expression.

The data in Table 17 exhibits a mean score for Group A of 3.13 and a mean score for Group B of 2.92. An analysis of the mean scores using the appropriate degrees of freedom yielded a t ratio of .526 which was not significant at the .05 level of confidence.

Table 17

A Comparison of Scale 10 (Creative Expression)
For Experimental Groups A and B

Group	Number	Standard Deviation	Mean	t
A	19	1.37	3.13	.526
B	20	.990	2.92	

Hypothesis 11

According to the null hypothesis there is no significant difference between the performance of students in Group A and students in Group B in the development of student initiative.

The data in Table 18 exhibits a mean score for Group A of 2.94 and a mean score for Group B of 3.06. An analysis of the mean scores using the appropriate degrees of freedom yielded a t ratio of .462 which was not significant at the .05 level of confidence.

Table 18

A Comparison of Scale 11 (Development of Student Initiative) For Experimental Groups A and B

Group	Number	Standard Deviation	Mean	t
A	19	.841	2.94	.426
B	20	.703	3.06	

Hypothesis 12

According to the null hypothesis there is no significant difference between the performance of students in Group A and students in Group B in establishing social climate.

The data in Table 19 exhibits a mean score for Group A of 3.18 and a mean score for Group B of 3.20. An analysis of the mean scores using the appropriate degrees of freedom yielded a t ratio of .058 which was not significant at the .05 level of confidence.

Table 19

A Comparison of Scale 12 (Social Climate)
For Experimental Groups A and B

Group	Number	Standard Deviation	Mean	t
A	19	.764	3.18	.058
B	20	.871	3.20	

Hypothesis 13

According to the null hypothesis there is no significant difference between the performance of students in Group A and students in Group B in subject matter preparation.

The data in Table 20 exhibits a mean score for Group A of 3.15 and a mean score for Group B of 3.27. An analysis of the data using the appropriate mean scores and degrees of freedom yielded a t ratio of .969 which was not significant at the .05 level of confidence.

Table 20

A Comparison of Scale 13 (Subject Matter Preparation) For Experimental Groups A and B

Group	Number	Standard Deviation	Mean	t
A	19	.326	3.15	.969
B	20	.402	3.27	

Hypothesis 14

According to the null hypothesis there is no significant difference between the performance of students in Group A and students in Group B in current application of subject matter.

The data in Table 21 exhibits a mean score for Group A of 3.23 and a mean score for Group B of 3.52. An analysis of the mean scores using the appropriate degrees of freedom yielded a t ratio of .871 which was not significant at the .05 level of confidence.

Table 21

A Comparison of Scale 14 (Current Application of Subject Matter) For Experimental Groups A and B

Group	Number	Standard Deviation	Mean	t
A	19	1.22	3.23	.871
B	20	.732	3.52	

IV. SUMMARY OF FINDINGS

The analysis of classroom teaching activities as measured by the IOTA yielded no significant difference between experimental Group A and experimental Group B in any of the 14 categories assessed.

The conclusions, recommendations and implications of these findings are discussed in Chapter V.

CHAPTER V

SUMMARY, CONCLUSIONS, RECOMMENDATIONS AND IMPLICATIONS

The purpose of this chapter was to (1) summarize the study, (2) draw conclusions based upon the findings, (3) formulate recommendations, and (4) discuss implications of the experiment.

I. SUMMARY

The summary has been divided into (1) purpose, (2) population, (3) procedures, and (4) findings.

The Purpose

It was the purpose of this study to determine if participants enrolled in a three semester on-site teacher preparation sequence would demonstrate significant differences in classroom teaching activities from those participants enrolled in a one semester on-campus and two semester on-site teacher preparation sequence.

The Population

The population for this study was comprised of 39 undergraduate students enrolled in the secondary teacher education program who had no previous professional education courses at Arizona State University, who were all in their junior year or above, and who had volunteered to participate in the experimental project.

Procedures

This experimental study was conducted on the campus of Arizona State University and in selected secondary schools in the greater Phoenix area. The study was designed for a period of three academic semesters during which participants were involved in an average of eight classroom hours of activity per week. The project began during the spring semester of the 1968-69 academic year and concluded during the spring semester of the 1969-70 academic year. The project was not conducted during the summer sessions of the 1968-69 year.

Students were randomly assigned to experimental groups A and B, composed of 19 and 20 students respectively. Random assignment was attained by a selection without replacement process using a hat as a sample box. Group A spent three consecutive semesters in on-site experiences which included weekly seminars with the professors directing the program and selected consultants. Group B spent one semester involved in various classroom activities at Arizona State University (see Appendix B) and two semesters in on-site experiences including the same weekly seminars as Group A.

A simple randomized group design using a posttest-only format was selected as the research design for this study. Post-testing sessions were held during the third semester of the experimental project, April, 1970, and all participants were observed and the IOTA was used as a criterion measure to assess the classroom teaching activities of the two groups. The posttesting was conducted

by trained observers and two 45 minute observations were made of each student in Group A and B in his practice-teaching classroom situation. All observations were completed within a period of two weeks.

Data gathered for the study were analyzed to ascertain if significant mean differences in classroom teaching activities did exist as a result of different teacher preparation sequences. The statistical technique employed in the study was the t test using a pooled variance formula to compensate for the unequal groups. A t ratio was computed for each of the 14 null hypotheses which corresponded to the 14 observation scales of IOTA. The criterion for statistical significance was the .05 level of confidence.

Findings

From the analysis of the data the findings, summarized in Chapter IV, revealed no significant differences in the mean behavior of experimental Group A and the mean behavior of experimental Group B as measured by the 14 observation scales of the IOTA.

II. CONCLUSIONS

The examination of the data produced no significant differences. Therefore, it may be concluded that the two training sequences resulted in no outstanding differences in fostering the desired classroom teaching activities of pre-service secondary teachers during a three semester preparation period. Since the experimental Pilot Project groups exhibited no significant differences, it

appears that it would make no difference which of the two experimental training sequences were selected to be incorporated into the undergraduate curriculum in the Secondary Education Department at Arizona State University.

It is further concluded that the amount of time spent in extended laboratory situations in the public schools as investigated in this study, two or three semesters, has no direct relationship to the teaching activities exhibited by students during the student teaching phase of their professional preparation.

III. RECOMMENDATIONS AND IMPLICATIONS FOR FURTHER RESEARCH

The results obtained from this study suggested certain implications and recommendations.

1. Since there was no significant difference in the classroom teaching activities of Group A and Group B, the possible incorporation of the sequence followed by experimental Group B would be most desirable. Physical and logistical problems associated with the placement and assignment of students for a three semester extended laboratory experience is more difficult than the two semester assignment for large numbers of student teachers and interns.

2. Since the origin of the experimental Pilot Project in secondary education at Arizona State University, additional groups have been added using additional sequences of preparation. It is recommended that additional studies be undertaken to compare the findings of this study and companion studies to the new sequences now in process.

3. Other instruments should be used to investigate possible differences between the experimental groups. In order to select the most effective program possible it seems feasible to further examine the attitude changes, value patterns, nonverbal behavior in the classroom, and the self-concept change and development of students involved in the experimental groups.

4. A questionnaire might be administered to all of the participants of additional studies of this nature to assess the individual's own concept of his competency and ability for entering the profession.

5. In future pilot studies, in order to be more easily studied and to increase generalizability, it is recommended that more careful planning be incorporated to provide more adequate baseline data and make provision for an in-depth comparison between the pilot project graduates and the graduates of the regular secondary teacher training sequence.

6. This experiment provided the groundwork and some base-line data for the beginning of a longitudinal follow-up study of the classroom teaching activities of the students in Group A and Group B as they become practicing professionals. A study of this nature may provide additional information as to the success of each training sequence which was not readily apparent at the end of the three semester experiment.

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APPENDICES

APPENDIX A

Teacher Roles and Project Guide to Objectives and Instructional Planning

Department of Secondary Education
Arizona State University

TEACHER ROLES

The following roles have been identified as characteristic of competent professional teachers.

I. GUIDE TO LEARNING EXPERIENCES

A. Plan: teaching learning situations in accordance with acceptable and utilizes it in planning learning activities.

1. Assembles a variety of pertinent data concerning the learner and utilizes it in planning learning activities.

2. Establish an appropriate short and long-range objective.

3. Attempts to meet the mental, social, psychological, and physical needs of students.

4. Begins instruction at the student level of instruction and achievement.

5. Requires student to participate in planning instructional activities.

6. Permits students to proceed at paces best suited to their individual rates of growth and is responsible for each student's maximum growth.

7. Provides for maximum student motivation.

8. Provides maximum student involvement through a variety of classroom activities.

9. Provides opportunity for students to apply their knowledge and skills in situations that are realistic and purposeful to the learner.

B. Utilized effective instructional procedures

1. Selects methods of instruction appropriate to the type of learning and objectives established.

2. Demonstrate basic skills of teaching.

3. Is skillful in utilizing techniques which stimulate thought and investigation.

4. Provides direct and vicarious experiences and relates them to the instructional program.

5. Utilizes both direct and indirect patterns of influence, is able to analyze his use of each, and is aware of their effects.

6. Encourages student to use a wide variety of resources for gathering data as a basis for making decisions.

7. Focuses attention on the process of inquiry as well as upon the outcomes or solutions to problems.

8. Stimulates a creative use of knowledge.

9. Communicates directions, assignments, and information clearly and affectively and utilizes a variety of media in so doing.

10. Permits students to assume the central role in instructional activities.

11. Leads students toward self-discipline and self-direction.

12. Provides opportunities for students to develop qualities and skills of group participation.

13. Provides varied opportunities for large group, small group and independent study experiences.

C. Provides a classroom atmosphere that is conducive to student achievement and constructive student attitudes.

1. Provides a rich and varied environment to facilitate and stimulate the learning process.

2. Demonstrates respect for the worth and dignity of each student as a person.

3. Has knowledge of and seeks to promote effective group dynamics.

4. Has realistic expectations for students and encourages students to do the same.

5. Practices good human relations procedures.

6. Displays a sense of humor.

7. Is available to provide assistance when needed.

8. Demonstrates emotional stability.

9. Displays consistent behavior in meeting classroom problems.

10. Is alert to the learners' perceptions and how they affect learning.

D. Utilizes adequate evaluation procedures.

1. Develops continuous evaluation as an integral part of instruction.

2. Seeks pupil and parent aid in developing a program of evaluation.

3. Demonstrates skill in the utilization of a variety of procedures of evaluation.

4. Helps student develop and practice self-evaluation.

5. Organizes and summarizes for meaningful interpretation.

6. Provides students and parents with meaningful reports on student progress.

7. Is able to evaluate the effectiveness of his own teaching.

II. CURRICULUM AND PROGRAM DEVELOPER

A. Participates effectively in the formulation of the aims of the school.

1. Contributes to the formulation of desirable over-all school aims, in cooperation with other educators and the general public.

2. Interprets the relationship of the school program to the desired aims.

3. Relates classroom objectives to the aims of the school.

4. Defines aims in terms suitable for evaluation.

B. Participates effectively in the development of a school program which will achieve its aims and objectives.

1. Becomes actively involved in matters related to improvement of the instructional program.

2. Utilizes effective procedures and relevant data in curriculum development.

3. Demonstrates knowledge of current curriculum trends, projects, and patterns.

4. Exercises leadership and initiative in curriculum development.

5. Stimulates and participates in discussion of vital instructional issues.

6. Selects structures and restructures content.

7. Carries on research activities related to program improvements.

C. Assumes responsibility for the implementation of over-all school program.

1. Articulates his classroom program to the school curriculum.

2. Articulates student activities with the school curriculum and accepts the responsibility for their proper functioning.

3. Accepts share of administrative responsibility for operation of the school.

D. Participates effectively in the continuous evaluation of the school program.

1. Uses appropriately stated aims as a basis for evaluation.

2. Assists in the collection of relevant data.

3. Interpret data to assess aims of programs and evaluate techniques.

4. Interpret results of evaluation to pupils, parents, and educators.

5. Makes changes in keeping with the evaluation.

III. COMPETENT SPECIALIST

A. Displays substantial knowledge of one or more subject matter fields taught in Secondary Schools.

1. Understands the structure of the subject matter.

2. Understands the methods of inquiry appropriate to the subject matter.

3. Utilizes subject matter in designing activities on the learners' level of understanding which promotes pupil attitudes, knowledge, and skills necessary for effective participation in a changing democratic society.

4. Display proficiency in the methodology appropriate to teaching the subject matter.

5. Knows his limitations as well as his abilities.

B. Relates his subject field to other content areas.

1. Uses data from various fields in solving problems or discussing issues.

2. Sees the relationship among disciplines and assists students in seeing these.

3. Utilizes his background in enriching student growth of a variety of types.

IV. MEMBER OF PROFESSION

A. Acts on a systematic philosophy, critically derived, and consistantly applied.

B. Acts in a professional and ethical manner.

1. Adheres to and helps enforce a professional code of ethics.

2. Supports administrative policy and procedures and assists in their study and development.

3. Assumes responsibility beyond his routine duties.

4. Seeks legislation that will improve education.

5. Communicates educational programs and interprets educational programs to the public.

6. Belongs to and assumes an active role in professional organizations.

7. Solicits and accepts help and suggestions from resource personnel.

G. Continues his professional growth

1. Participates in a planned program of continuing education.

2. Keeps abreast of current research and approved techniques and methods.

3. Reads professional and contemporary literature.

V. MEMBER OF COMMUNITY

A. Establishes and maintains appropriate community relationships.

1. Supports enterprizes and projects that promote the best welfare of the community.

2. Participates in community affairs.

B. Provides an example of citizenship for others.

1. Acts within the law.

2. Adjusts to social morals of the school-community.

3. Exercises his right to take a stand, including a dissenting stand, on public issues.

4. Participates in the solution of the problems of various ethnic, religious and racial groups.

5. Votes in local, state, and national elections.

6. Conducts his financial affairs in a responsible manner.

I-A Instructional Planning

1. Assemble and use information about the learner in planning teaching activities, to be evidence by written copy of learner data and written copy and/or observation of such information being used.
2. Write objectives in behavioral and enabling terms to be evidenced by copy of the same.
3. Identified actual needs of students which are unique and require individual attention, evidenced by using individualized approach to teaching and use of materials.
4. Provide instruction at student's level of understanding, evidenced by statistical analysis of students test results on materials which have been the subject of instruction.
5. Utilize student participation in planning of activities for teaching situations, evidenced by
   a. recorded informal observation
   b. lesson plans or records showing such participation
   c. application of IOTA observational instrument
6. Provides for a variety of classroom activities as evidenced by informal observation, lesson plan showing variety and application of IOTA.
7. Provides learning situations which are purposeful and meaningful to the learner as evidenced by observation of student attending behavior, variety of student initiated learning activities, lesson plans, and informal talks with the teacher.

PROJECT OBJECTIVES

I-B Part I

A. Establishes objectives which are consistent with the needs, interests, and cultural and educational backgrounds of the students concerned, as evidenced by a comparison of the stated objectives with the characteristics of individual learners.

B. Selects and utilizes strategies of inquiry which are appropriate to the type of learning indicated by the objectives which have been established. Appropriateness would be judged by comparing lesson plans with a written statement of objectives and by the observation of experts as the pre-teacher works with children in the classroom.

C. Demonstrates basic skills of teaching as determined and evaluated by a team of experts, including the cooperating teacher, a subject area specialist, and a teacher education supervisor.

D. Skillfully utilizes techniques to stimulate thought and investigation, evidenced by the degree of active involvement in such activities by students in the classroom.

E. Encourages the use of a wide variety of resources for gathering data for decision-making as evidenced by the extent of the variety of resources being used in the classroom.

F. Focuses attention on the process of inquiry as well as upon the outcomes or solutions to problems as evidenced by the I-D ratio on Flander's Interaction Analysis, a predominance of "higher levels" of questioning in class discussions, and by

the use of questions in examinations which tend to push the students toward the higher levels within the cognitive domain.

G. Communicates directions clearly and concisely as evidenced by the ability of students to proceed directly to the tasks indicated without undue confusion.

I-B Part II

A. Provides direct and vicarious experiences and relates them to the instructional program as evidenced by the observation record of the supervisory team.

B. Utilizes both direct and indirect patterns of influence as evidenced by the I/D ratio of Interaction Analysis and by comparing the IA matrix with the lesson objectives.

C. Stimulates a creative use of knowledge as indicated by the breadth of the range of acceptable responses in a given situation.

D. Provides opportunities for students to develop qualities and skills of group participation as indicated by the frequency of occurrence of this type of activity and the degree of competence with which it is directed.

E. Provides varied opportunities for large group, small group, and independent study experiences as evidenced by lesson plans or observation indicating that such a variety of grouping situations are regularly employed, and by comparing these arrangements of types of activities with the objectives established for consistency.

I-B Part III

A. Permits students to assume the central role in instructional activities as indicated by a comparison of the percentage of time the teacher spends teaching as opposed to the amount of time the students are at the fore-front of the instructional activities, by a comparison of the amount of time devoted to teacher-talk as opposed to student-talk or interaction or activity, or as indicated by the I/D ratio of Interaction Analysis.

B. Leads students toward self-discipline and self-direction as indicated by a shift from teacher-direction toward student self-direction measured by a comparison of the number of times the teacher directs the class to a decision and the number of times students are charged with making the decision.

C. Provides a classroom atmosphere that is conducive to student achievement and constructive student attitudes.

1. Provides a rich and varied environment to facilitate and stimulate the learning process as evidenced by informal observation and Scale 1 of the IOTA instrument.

2. Has knowledge of and seeks to promote effective group dynamics as recorded by IA, Scales 8, 9, 10, 11, 12, 13, of the IOTA instrument, and lesson plans.

3. Demonstrates respect for the worth and dignity of each student as a person to be evidenced by recorded informal observation, IA, various attitude measures, and Scales 9, 10, 13, of IOTA.

4. Has realistic expectations for students and encourages students to do the same indicated by written data on students; informal observation and/or recorded information of such encouragement; and Scales 5, 6 of IOTA.
5. Practices good human relations procedures evidenced by use of IA, Scales 4, 6, 8, 9, 10, 13, of IOTA and informal observation.
6. Is alert to the learners perceptions and how they affect learning as evidenced by written copy of sub information, Scale 9, 10, 12, of IOTA and informal observation.
7. Displays a sense of humor indicated by attitude scales and recorded informal observation of humor being used.
8. Demonstrates emotional stability as evidenced by IA, Scales 4, 9, 10, of IOTA, informal observation, and attitude inventory.
9. Displays consistent behavior in meeting classroom problems as evidenced by 2 or 3 recordings of IA at spaced intervals, written record of how situations are handled, and Scales 12 and 13 of IOTA.

I-C Provides a classroom atmosphere that is conducive to student achievement and constructive student attitudes.

1. Provides a rich and varied environment to facilitate and stimulate the learning process as evidenced by informal observation and Scale 1 of the IOTA instrument.
2. Has knowledge of and seeks to promote effective group dynamics as recorded by IA, Scales 8, 9, 10, 11, 12, 13, of the IOTA instrument, and lesson plans.
3. Demonstrates respect for the worth and dignity of each student as a person to be evidenced by recorded informal observation, IA, various attitude measures, and Scales 9, 10, 13, of IOTA.
4. Has realistic expectations for students and encourages students to do the same indicated by written data on students; informal observation and/or recorded information of such encouragement; and Scales 5, 6, of IOTA.
5. Practices good human relations procedures evidenced by use of IA, Scales 4, 6, 8, 9, 10, 13, of IOTA and informal observation.
6. Is alert to the learners perceptions and how they affect learning as evidenced by written copy of sub-information, Scale 9, 10, 12, of IOTA, and informal observation.
7. Displays a sense of humor indicated by attitude scales and recorded informal observation of humor being used.
8. Demonstrates emotional stability as evidenced by IA, Scales 4, 9, 10, of IOTA, informal observation, and attitude inventory.

I-D Part I

A. Developing continuous evaluation as an integral part of instruction, test plan and use of tests, use of other feedback devices, interview, observation, use of programmed materials.

B. Demonstrates skill in the utilization of a variety of procedures of evaluation, observation of evaluation procedures, read test directions, interview on variety, IOTA variety of activities scale.

C. Help students develop and practice self-evaluation, informal observation, lesson plans, count scales, IOTA development for student evaluation, interview.

D. Organizes and summarizes for meaningful interpretation, lesson plan, interview, observation of video tapes, IOTA observation (activity phase).

E. Is able to evaluate the effectiveness of his own teaching, IA matrix, compare to objectives, IOTA Scales, develop a scale to be given to pupils.

I-D Part II

A. Utilizes subject matter in designing activities on the learner's level of understanding, which promotes pupil attitudes, knowledge and skills necessary for effective participation in a changing democratic society as measured by lesson plans, student questionnaire and IOTA Scale, content cross, and IA 9's.

B. Displays proficiency in the methodology appropriate to teaching the subject matter as measured by the judgment of experts of video tapes.

C. Relates his subject field to other content areas, IOTA Scale on relevancy, lesson plans, course of study, readings assigned.

III A - Part I

1. The teacher understands the structure of the subject matter as evidenced by written plans, Scale 14 of IOTA, and evaluated by the supervisory team composed of the cooperating teacher, subject area specialist, and secondary education professor.
2. Understands the methods of inquiry appropriate to the subject matter as indicated by the methods of inquiry used in the classroom and discussions of the methods of inquiry.

III A - Part II

1. Utilizes subject matter in designing activities on the learner's level of understanding, which promotes pupil attitudes, knowledge and skills necessary for effective participation in a changing democratic society as measured by lesson plans, student questionnaire, and IOTA Scale, content cross, and IA 9's.
2. Displays proficiency in the methodology appropriate to teaching the subject matter as measured by the judgment of experts.
3. Relates his subject field to other content areas by using data from other fields in the solution of problems and discussion of issues. IOTA scale on relevancy, lesson plans, course of study, readings assigned.
4. Knows his limitations as well as his abilities as evidenced by observation and interviews.

IV Member of Profession

A. Acts on a systematic philosophy, critically derived, and consistently applied as evidenced by a comparison of behavior with their stated philosophy using observations through IA and IOTA.

B. Acts in a professional and ethical manner.

1. Adheres to and helps enforce a professional code of ethics as evidenced by observation by cooperating teachers and other professional personnel.

2. Supports administrative policy and procedures and assists in their study and development.

3. Assumes responsibility beyond his routine duties as evidenced by observations by cooperating teachers and other professional personnel.

4. Seeks legislation that will improve education.

5. Communicates educational problems and interprets educational programs to the public.

6. Belongs to and assumes an active role in professional organizations.

7. Solicits and accepts help and suggestions from resource personnel by oral and written reports of students seeking and using advice.

APPENDIX B

Group B--Professional Sequence

Pilot Group B

Spring Semester 1968-69

Week 1

Tuesday 2-4 Registration and various details
Testing: Minnesota Attitude Scale, Alport Scale of Values, Sematic Differential, EPI

Thursday 2-6 Give booklist and discuss; give dept. obj., roles of the teacher and discuss
Discuss course outline with major headings of: What is teaching? Skills of teaching-social interaction, instructional interaction, and instructional design.
Discuss what is teaching--suggest reading from Bellack, Smith or Taba
Play video tape--711 composite--discuss at various places

Week 2

Tuesday 2-11 Playback of Felty tape and discuss
Plan a video lesson for Thursday
Plan a micro lesson (divide by subject)

Thursday 2-13 Tape each person for 6 min.

Week 3

Tuesday 2-18 Give list of students--identify each other
Playback and discuss tapes (What is teaching?)
Gave handout of Smith-Bellack

Thursday 2-20 Playback of tapes
Work on micro units

Week 4

Tuesday 2-25 Introduction of IA - Flanders 4 & 5, Amidon Level 1--Read Ch. 2

Thursday 2-27 IA practice--matrix interpretation, Read Ch. 1--turn in micro unit

Week 5

Tuesday 3-4 IA--review and give focus 5 to go all the way through--turn in next Tuesday. Discuss micro unit--assign a micro teach with a focus related to IA

Thursday 3-6 Video tape

Week 6

Tuesday 3-11 Playback of tapes with IA focus. Began questioning strategy sequence with practice lesson. Gave handout on "Characteristics of Good Teachers" Phi Delta Kappan

Thursday 3-13 Video tape each student for 5 min. using skills of redirection and calling on nonvolunteers-playback and use evaluation form. Give instructional set for Lesson 1.

Week 7

Tuesday 3-18 Video tape each student for 6 min. on Lesson 1. Give instructional sequence for Lesson 2

Thursday 3-20 Video tape each student for 8 min. on lesson 2. Part of group use evaluation form at same time. Playback if necessary or desired.

Week 8

Tuesday 3-25 Instructional sequence for Lesson 3. Break into three groups for discussion of PDK article "Characteristics of Good Teachers and Implications for Teacher Education."

Thursday 3-27 Video tape on Lesson 3--playback and discuss

Week 9

Tuesday 4-1 Instructional sequence for Lesson 4. Reminded students of their need to read outside of class. We will start next week with new materials for outside work. Dr. Griffith discussed various problem areas they may face--salary, teaching conditions, job opportunities, personal problems

Thursday 4-3 Vacation

Week 10

Tuesday 4-8 Video on Lesson 4

Thursday 4-10 Instructional Sequence 5
Visit to curriculum library. Give instruction on various materials available (course of study, curriculum guides, resource and teaching units, text, supplementary materials). Gave student mini-pac I and instructions on its use. Choose one or more activities for project.

Week 11

Tuesday 4-15 Video Lesson 5

Thursday 4-17 Discussion of questioning strategy and use of discussion technique--give handout on set induction. Dr. Moulton at 10:30 on group dynamics.

Week 12

Tuesday 4-22 Wrap-up of Interaction Analysis (feedback on Focus 5)
Introduction of set induction with video tapes and discussion. Write one in subject area. Dr. Moulton at 10:30 on group dynamics.

Thursday 4-24 Discussion on value and uses of group dynamics.
Small groups by subject to discuss set
Introduction to instructional objectives (Vimset 2 and 3)

Week 13

Tuesday 4-29 Introduction to Unit Planning. Start designing curriculum with course outline. Check with library and revise. Begin unit construction.

Thursday 5-1 Work in library

Week 14

Tuesday 5-6 Show video tape on non-verbal behavior
Work in library on unit and/or project from mini-pac

Thursday 5-8 Work in library

Week 15

Tuesday 5-13 Work in library

Thursday 5-15 Discuss assignments for next fall and some problem areas.
Work in library on projects.

Week 16

Tuesday 5-20 Dave Jacobsen on AV aids

Thursday 5-22 Plan and present a 20-minute lesson from the Unit. Video tape and playback parts of the tape with a critique and general discussion.

Final week session

Wednesday 3-5 p.m. Write and discuss evaluation of class. What to add or delete for next group. Suggestions for improvement. Final preparation for next fall. Meet by subject and with people from A group to exchange experiences.

APPENDIX C

Hierarchial Order of IOTA Observation Scales and Descriptors

1. Interest Centers

The Teacher:

5. Involves students in planning and arranging stimulating centers of interest relating to current learning activities.

4. Arranges interest centers which are related to current activities.

3. Depends upon visual aids to serve as interest centers, which are not necessarily related to classroom activities.

2. Prepares interest centers which are not necessarily related to classroom activities.

1. Uses no centers of interest to foster learning.

2. Variety in Activities

The Teacher:

5. Shows evidence of abundant and varied activities and projects for all children.

4. Provides opportunity for a number of varied activities and projects.

3. Provides some varied activities and projects.

2. Provides limited variety in classroom activities.

1. Provides little or no variety in classroom activities.

3. Use of Material for Instruction

The Teacher:

5. Makes effective use of a wide variety of well-selected instructional materials.

4. Makes good use of a wide variety of instructional materials.

3. Makes good use of instructional materials.

2. Makes limited use of common instructional materials.

1. Makes ineffective use of common instructional materials.

4. Classroom Control

The Teacher:

5. Provides an atmosphere in which industrious self-regulation is generally maintained.

4. Encourages self-directed standards of conduct that are maintained with occasional lapses.

3. Imposes standards of conduct that are generally maintained.

2. Intervenes frequently to maintain control.

1. Imposes authority rigorously which is frequently circumvented or ignored.

5. Learning Difficulties

The Teacher:

5. Assists individuals and groups to resolve learning difficulties.

4. Provides individual and group instruction for most cases of learning difficulties.

3. Provides group instruction to resolve obvious learning difficulties.

2. Provides little or no help for identified learning difficulties.

1. Ignores learning difficulties.

6. Individualization of Instruction

The Teacher:

5. Recognizes and deals with each student according to his needs, aptitudes, talents, and learning style.

4. Arranges differentiated experiences to meet the needs and abilities of most individual students.

3. Arranges for differentiated small group experiences with some attention to individuals.

2. Provides some differentiated experiences to meet small group needs.

1. Provides the same learning experience for all of the class.

7. Development and Implementation of Classroom Goals

The Teacher:

5. Develops goals with class and plans cooperatively for their attainment.

4. Clarifies, through discussion, predetermined goals, encourages class to share in the planning for their attainment.

3. Clarifies, through discussion, predetermined goals and plans for their attainment.

2. Informs class of predetermined goals and procedure for their attainment.

1. Gives inadequate directions without making goals or plans for their attainment known to the class.

8. Opportunity for Participation

The Teacher:

5. Provides abundant and varied opportunities for individual and group expression in discussion and other activities.

4. Encourages students to participate in discussion and related activities.

3. Elicits student response in teacher-led discussions and activities; permits some student questions and discussion.

2. Lectures as a large part of the time; does not involve students in discussion.

1. Dominates discussion, students respond only when called upon.

9. Exploration of Value Judgments

The Teacher:

5. Provides experiences to encourage students to explore differing points of view in order to develop value judgments.

4. Utilizes differing points of view to stimulate students in developing value judgments.

3. Provides some opportunities for students to express differing points of view.

2. Permits differing points of view by students.

1. Discourages expression of differing points of view by students.

10. Creative Expression

The Teacher:

5. Provides challenge and opportunity for both individual and group creativity.

4. Provides activities which encourage creative expression.

3. Utilizes creative activities as an incidental part of learning.

2. Limits creative expression to special occasions only.

1. Permits little or no opportunity for creative expression.

11. Development of Student Initiative

The Teacher:

5. Utilizes activities to encourage and develop student initiative in a wide variety of ways.

4. Provides a variety of classroom activities to develop student initiative.

3. Provides some opportunities for developing student initiative.

2. Permits students to exercise initiative in a limited number of activities.

1. Allows little or no opportunity for student initiative.

12. Social Climate

The Teacher:

5. Provides an environment in which results in cooperation and mutual respect among all students.

4. Develops positive student relationships which prevail with few exceptions.

3. Encourages a spirit of cooperation among students.

2. Demonstrates limited effort to enhance student relationships.

1. Makes no effort to enhance student relationships.

13. Subject Matter Preparation

The Teacher:

5. Demonstrates a thorough command of the subject matter and a wealth of general knowledge.

4. Demonstrates extensive preparation in subject matter and related areas.

3. Shows adequate preparation in subject matter.

2. Shows limited preparation in subject matter.

1. Shows inadequate preparation in subject matter.

14. Current Application of Subject Matter

The Teacher:

5. Evidences skill in relating subject matter to its current application by providing opportunities for utilization.

4. Relates subject matter to its current application as enrichment in some areas.

3. Indicates how current application of subject matter may be made, but provides limited opportunities for utilization.

2. Stresses subject matter overlooking most possibilities for application to current utilization.

1. Makes no connection between subject matter and its application to daily living.

APPENDIX D

Pilot Test for Establishment of Interobserver Reliability

TO: Classroom Teacher

FROM: IOTA Workshop Director

SUBJECT: Classroom Visitation by IOTA Workshop Participants

I would like to thank you for allowing members of our workshop to observe your teaching activities. The visitors are observing the classroom activities for the sole purpose of improving their observation skills and not to make comments concerning means of improving the teaching or in any way rating teachers.

Members of the visitation team will record their observations of the classroom activities (only what they actually saw and heard) and will give you a carbon copy of those observations.

Your cooperation is very much appreciated. Please accept our thanks for assisting the workshop to achieve its purposes.

Monday Classroom Visitation
Whitman School
1829 North Grand Avenue

Time: 8:15 Pre-Conference
8:30 Observation
9:30 Post-Conference

Team 1 Teacher: France--6th Grade

Mrs. Julia Carter (Team Leader)

Rev. Robert Sackmann

Peter Sesow

Rev. Fred Mallot

Team 2 Teacher: Woods--6th Grade

Dr. Don Hess (Team Leader)

Rev. Hughston Peyton

Father Leo Brogan

Rev. Carl Soderbert

Team 3 Teacher: Scott--6th Grade

William Polhemus (Team Leader)

Rev. Ralph Strong

Jon McKallor

Bruce Jackson

Rev. Bill Hastings

Team 4 Teacher: Oakes--6th Grade

Jim Carpenter (Team Leader)

Dr. Robert Anderson

Dr. Keith Orr

Dr. O. L. Buchanan

Bill McLaughlin

Team 5 Teacher: Frase

David Jacobsen (Team Leader)

Dr. LeRoy Griffith

Dr. James Bell

Don Kelly

APPENDIX E

The Role of the Observer

The Role of the Observer

Over the decade since the instrument and procedures were first developed, the Committee on IOTA has been active in developing revisions and conducting statistical studies designed to enhance the quality of measurements to be obtained from use of the instrument and procedures. Without going into extensive detail, the guiding principles have been the following:

To promote validity.	Improve the objectivity and clarity of the criterion.
	Develop techniques for involving the school staff in scale construction.
	Revise the items in the scales to enhance uniform interpretation.
	Through statistical analysis, identify items used too frequently or too infrequently.
	Obtain evidence through both observations and interviews.
	Devise procedures for training observers efficiently.
To enhance reliability.	Revise the items in the scales, where necessary, to secure objectivity, concreteness, and description in non-evaluative terms.
	Obviate misinterpretation by precise definitions of behavior and removal of ambiguity.
	Place emphasis on concision of statement, with a target of one line per item.

To enhance discriminative ability. Limit each scale to one variable. (A scale concerned with classroom control should not, for example, relate both to conformity and to origin of standards for control.)

Locate the central tendency in each scale near the middle step (at 3 on a possible high of 5).

Separate data-gathering from data evaluation.

Through statistical analysis and revision, provide items that are each used, over a number of observations, with a mode near the central tendency.

Through these extended studies and analyses it was possible to secure some improvements in the characteristics of the instrument. The coefficient of reliability was improved from .87 in the initial version in Hawaii to a high of .97 in one of the later ones. It became increasingly evident, however, that the improvement to be accomplished through revision of the scales was limited. The importance of the role of the observer and the need for observer training became increasingly evident. This was not apparent in Hawaii, since the observers had a common philosophy developed through common experience and their training in the use of the instrument was coincidental with the try-outs and revisions. It has become quite clear that the primary function of the instrument is to provide a frame of reference for orientation of the observer, who, in fact, actually becomes the measuring instrument. The training program must be designed to standardize his procedures, if the measurements are to have the desired quality and characteristics. He must know,

in general, what to look for in the observations, and how to use his observation sheet effectively as a guide to specific data. He must learn to neglect the irrelevant, to record facts and behavior rather than evaluative comments, to suppress his biases, to accept the philosophies of the scales, for the time being at least, and to be familiar with the materials provided for his record and evaluation sheets.

When the observer retires to compare his notes with the items on the scales, he is unlikely to find a one-to-one correspondence between the comments in his notes and the items on the scales. These latter are illustration of classes of behavior that are evidence of given levels of competence. The observer must be able to recognize equivalent behavior of the same class, indicating the same level of competence.

It goes without saying that if the measurements obtained through observation are to be reliable, discriminative, and valid, the notes made by the observer must meet the same requirements as do those held for the items on the scale, namely, they must be concise, objective, and non-evaluative, limited to only one variable, non-ambiguous and concrete. To make such notes is a skill to be learned through training. So also is the ability to suppress one's biases in order to avoid halo effect and to adopt for the time being at least, a philosophy in common with other observers. The development of programs for training to "standardize" the work of the observers was a major contribution of the IOTA Committee.

The IOTA scales state in behavioral terms what is expected of the competent classroom teacher. It is an operational definition of competent teaching. Through classroom observations and interviews it is possible to ascertain with considerable accuracy a profile of the teacher's actual classroom performance. See Appendix C for scale definitions and hierarchial breakdown of the descriptions for each scale.

BIOGRAPHICAL SKETCH

Donald E. Kelly was born on June 18, 1939 in Greeley, Colorado, and received his elementary education in the public schools of LaSalle, Colorado, and his secondary education at the Colorado State College Laboratory School. In 1961, he completed requirements for the Bachelor of Arts Degree in History at Colorado State College. His Master of Arts Degree, Educational Psychology and Guidance, was conferred by Colorado State College in 1964.

He has had experience in the public schools in Greeley, Colorado as a social studies teacher, basketball and baseball coach, counselor, and administrative assistant to the principal of a junior high school. For the last two years he has been a faculty associate and graduate teaching assistant in Secondary Education at Arizona State University.

He is a member of the Association for Supervision and Curriculum Development, the Arizona Association for Supervision and Curriculum Development, the National Education Association, the American Association of University Professors, the International Society for Programmed Instruction and Phi Delta Kappa.

He is married to Georgann Sandman Kelly. They have one son, Kristofor.